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THE GENERA

OF

RECENT MOLLUSCA.

VOL. II.

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THE GENERA

OF

RECENT MOLLUSCA;

ARRANGED

ACCORDING TO THEIR ORGANIZATION.

BY

HENRY ADAMS, F.L.S.

AND

ARTHUR ADAMS, M.R.C.S., F.L.S.

IN THREE VOLUMES.—VOL. II.

LONDON:

JOHN VAN VOORST, PATERNOSTER ROW.

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Class GASTEROPODA.

Sub-class OPISTHOBRANCHIATA.

Gills exposed, or only slightly covered by a fold of the mantle, situated behind the heart, and never lodged in a distinct, cervical cavity. Sexes united in the same individual. Abdomen rudimentary, not spirally developed in the adult, or protected by a shell. Larva shell-bearing, and furnished with deciduous cephalic fins.

The Mollusks which comprise the Opisthobranchiate division of the Branchiferous Gasteropods are characterised, in the larval state, by the same peculiarities of organization which are found in the Prosobranchiate tribes, the young animal being provided with a turbinate or spiral shell the aperture of which is closed by an operculum, and the head bearing on the fore part a large membranous veil, more or less bi-lobed, and fringed at the margin with vibratile cilia which serve as organs of locomotion; in fact, as Milne Edwards has remarked, it is difficult to distinguish the larvæ of *Eolis* and *Aplysia* from those of *Buccinum* and *Vermetus;* in the perfect state, also, they are provided with gills, and their respiration is aquatic, as in the former sub-class, but in

84310

the Opisthobranchiate Orders the blood arrives at the heart more or less obliquely from behind forwards, and the auricle is usually situated behind the ventricle; the respiration is effected by the aid of arborescent or fasciculated gills, which are never enclosed in a special cavity, but are more or less completely exposed on the back, or at the sides, towards the hind part of the body; the cervical region, moreover, is entirely naked; the reproductive apparatus is hermaphrodite, the male and female organs being found in the same individual, and the shell, well-developed in the larva, becomes rudimentary, or even entirely disappears, in the adult animal.

Order TECTIBRANCHIATA.

Gill forming a tuft or plume on the side, towards the hind part of the body, under a fold of the mantle, and usually protected by a shell. Both the adult animal and larva shell-bearing. Foot elongate, formed for walking. Marine.

Observed under favourable circumstances in their native haunts, the Tectibranchiate Mollusks are by no means unattractive or sluggish in their habits, but contribute, by their changing forms and lively colours, to lend animation to the weedy shores and coral reefs among which they take up their abode. The *Bulla*, there no longer a shapeless mass of blubber, expands its fleshy foot-lobes and floats leisurely through the water; and, crawling on the rocks above the ripple of the sea, the green, amphibious *Smaragdinella* may be observed probing the surface with its plastic head-disk. Gliding along the surface of the slimy mud, the *Pleurobranchus*

may be seen, its back splendid with varied colours, or the *Operculatum*, more sedentary in its habits, fastened, by its thick, deep, orange foot studded with pearl-like tubercles, to the bottom of the shallow pools; while gliding briskly along the branches of the corals the *Aplysiæ* or "Sea Hares" may be noticed, extending their necks, and busily exploring everything within their reach. The gills in this Order are unsymmetrical, more or less covered by the mantle and protected by a shell, in some families being situated on the hinder part of the back, and in others at the side of the body under the margin of the mantle. The sexes are united, the male and female organs existing in the same individual, so that reciprocal impregnation is necessary to reproduction. The shell is either external and spiral, and provided with an operculum, as in *Actæon;* conical and external, as in *Tylodina* and *Operculatum;* rudimentary, and contained in a fold of the mantle, as in *Philine* and *Aplysia;* or it is altogether wanting, as in *Bursatella* and *Runcina.* The eyes are sessile on the head, and the tentacles are either auriform and folded on themselves, as in the *Aplysiidæ*, or are united to form a broad cephalic disk, as in the *Bullidæ.*

Fam. ACTÆONIDÆ.

Teeth, central none, lateral numerous, uncinated, in a diverging cross series. Head depressed, forming a quadrate disk, bi-lobed in front, with broad, posterior, tentacular lobes; eyes sessile on the middle of the head. Mantle included within the shell; branchial plume single. Foot oblong, truncate in front, obtuse behind.

Operculum horny, linear, transverse.

Shell involute, with the columella plicate or spirally twisted.

The armature of the lingual membrane, and the form of the head in this family indicate a close affinity with the *Bullidæ*. The animal does not invest the shell, and when observed crawling, the tentacular lobes of the head-disk are reflexed upon the fore part of the body-whorl. The systematic position of this family has been a matter of doubt among Zoologists, some having placed it near the *Pyramidellidæ*, and others with the *Auriculidæ*. The genera *Itieria* of Matheron, *Actæonella* of D'Orbigny, and *Cylindrites* of Lycett, are fossil, while the extinct fossil genera *Cinulia*, Gray, *Tylostoma*, Sharpe, and *Globiconcha*, D'Orbigny, would appear rather to belong to the Pectinibranchiate family *Doliidæ*.

Genus ACTÆON, Montfort.

Shell thin, ovate, transversely striated ; spire produced, acute; aperture elongated, narrow, anteriorly rounded and entire; inner lip thin; columella with a single, oblique plait.

Syn. Auris Mustelæ, *Humph.* Tornatella, *Lam.* Speo, *Risso.* Kanilla, *Silvertrop.* Myosota, *Gray.*

Ex. A. tornatilis, *Linnæus*, pl. 56, fig. 1. Shell, A. tornatilis, fig. 1, *a*.

The broad tentacular lobes are reflexed and partly cover the shell when the animal is observed crawling, showing a very strong affinity with the *Bullidæ;* the shells, moreover, greatly resemble those of *Bullina* of Férussac. From *Buccinulus* or *Solidula*, the shell differs in being of a lighter texture, and in the columella being

provided with but a single plait. Several species have been described from Equatorial Seas, and one, the *Voluta tornatilis* of Linnæus, is an inhabitant of the Mediterranean and of the British Islands. Many fossil shells occur in the Secondary and Tertiary formations which appear to belong to this genus.

Species of Actæon.

Bevaletii, *Baudon.*
Cumingii, *A. Adams.*
Dianæ, *A. Adams.*
flammeus, *Gmel.*
Mariæ, *A. Adams.*
modestus, *A. Adams.*
oryza, *Reeve.*
pudicus, *A. Adams.*
puncto-striatus, *Couth.*
Senegalensis, *Petit.*
Sieboldii, *Reeve.*
tornatilis, *Linn.*
venustus, *D'Orb.*
virgatus, *Reeve.*

Genus BUCCINULUS, Plancus.

Shell thick, solid, ovate, transversely sulcate; spire elevated, acute; aperture longitudinal, narrow, entire and rounded anteriorly; inner lip thickened, callous; columella with two spiral plaits, the anterior grooved and continued into the outer lip.

Syn. Pupa, *Bolt.*, not *Humph.* Solidula, *Fischer.* Dactylus, *Schum.*, not *Klein.*

Ex. B. solidulus, *Linnæus*, pl. 56, fig. 2, 2, *a*. Operculum, B. solidulus, fig. 2, *b*, 2, *c*. Shell, B. solidulus, 2, *d*.

The principal characters which seem to separate this genus from *Actæon*, consist in the solid structure of the shell, and in the double spiral fold of the columella. In the allied fossil genus *Actæonella* the aperture is posteriorly canaliculated, and there are three large folds on the

columella, and in *Itieria*, another extinct form, the outer lip is internally plicate.

Species of Buccinulus.

affinis, *A. Adams.*
coccinatus, *Reeve.*
glaber, *Reeve.*
insculptus, *Reeve.*
nitidulus, *Lam.*
punctatus, *Mart.*
pusillus, *A. Adams.*
solidulus, *Linn.*
suturalis, *A. Adams.*
tessellatus, *Reeve.*

Fam. APLUSTRIDÆ.

Teeth, central none; lateral numerous, uniform. Head with the frontal disk produced into large ear-like, tentacular lobes folded over the back of the shell, and furnished with bifid labial appendages; eyes sessile at the inner bases of the tentacular lobes. Mantle with the inner margin thin and membranous, the outer forming a thick, fleshy lobe, curving round the spire of the shell; branchial plume long and single. Foot large and membranous, auriculate in front, rounded behind.

Operculum none.

Shell external, involute, ornamented with coloured bands or markings; aperture more or less channelled at the fore part.

Genus APLUSTRUM, Schumacher.

Shell globosely ovate, axis imperforate, solid, smooth, banded, covered with a thin epidermis; spire obtuse; aperture oblong, with a short, wide canal at the fore part; inner lip thin, membranous, adnate posteriorly to the body-whorl, free and forming a spiral lamina anteriorly;

columella straight, solid, twisted, and obliquely truncate in front: outer lip acute, thickened internally.

Syn. Aplustra, Savigny.

Ex. A. aplustre. *Linnæus*. pl. 56. fig. 3. Shell. A. aplustre. fig. 3. *a*.

The animal of this genus is very similar, both in markings and colour, to that of *Hydatina*, but the shell, in place of being convoluted, with the axis perforate as far as the apex of the spire, has a straight and solid columella, and the fore part of the aperture is slightly channelled. The only species known is from the Mauritius, where it seems to prefer the muddy banks of the mouths of the rivers.

Genus PHYSA. Schumacher.

Shell involute, thin, semitransparent, axis perforate as far as the spire, smooth, banded, covered with a thin, horny epidermis: spire depressly funnelled, last whirl inflated: aperture expanded and entire in front, inner lip membranaceous, adnate to the body-whirl: columella arcuated, reflected, continued somewhat into the inner lip: outer lip thin, simple, acute.

Ex. H. circulus. *Martyn*. pl. 56. fig. 4. Shell. H. physis. *Linnæus*. fig. 4. *a*.

The animal of this genus is adorned with beautiful colours, and when viewed fully expanded and crawling among the bright green algæ in clear water over a sandy floor, exhibits a beautiful appearance. Unlike that of *Aplustrum*, the shell in this genus is involute, the inner lip forming a spiral canal similar to that in *Ahera*. The whirls are handsomely banded and marked

with gay colours. Ceylon, China, the Mauritius, and the West Indies, are the countries inhabited by the animals of this genus, which is not, however, numerous in species.

Species of Hydatina.

albocincta, *V. d. Hoeven.*
circulata, *Martyn* (vexillum, *Chem.*).
nitidula, *Lister.*
physis, *Linn.*
virgata, *Martyn.*

Genus BULLINA, Férussac.

Shell ovate, solid, axis perforated; spire rather elevated, whorls transversely grooved, with coloured markings; aperture longitudinal, broadly channelled in front; inner lip thin, adnate to the body-whorl; columella arched forwards, and obliquely sub-truncate anteriorly; outer lip grooved internally, and with the margin crenulated.

Syn. Bullinula, *Beck.*

Ex. B. undata, *Bruguière*, pl. 56, fig. 5. Shell, B. undata, fig. 5, *a.*

The animal of *Bullina* is not well known. The shells greatly resemble those of *Actæon*, but want the spiral plate of the inner lip peculiar to that genus; they are transversely grooved and punctate, and are adorned with brightly-coloured bands and undulating lines. The species are few in number, and are from Japan, Ceylon, and Australia.

Species of Bullina.

Bruguièri, *A. Adams.*
scabra, *Chem.*
undata, *Brug.*

Fam. CYLICHNIDÆ.

Teeth, central none, lateral 6.6, the inner large and hooked, the outer small and uniform, rarely wanting. Head with the frontal disk depressed, sub-quadrate, truncate in front, produced behind into broad, flattened, recumbent, tentacular lobes, with the eyes immersed in the front of their bases. Mantle with a posterior thickened process or lobe. Foot shorter than the shell, truncate in front.

Operculum none.

Shell external, spirally convoluted, more or less cylindrical, without coloured markings.

In this group the cephalic disk is furnished with lateral lobes, which are not folded and ear-like as in *Aplysiadæ*; the labial tentacles also are not developed as in that family, and the foot is small and truncate behind, instead of being large, expanded, and membranous. Their habits are sluggish, and their progression very slow, the locomotive disk not being well-developed.

Genus CYLICHNA, *Lovén.*

Tentacular lobes connate, indistinct: eyes sessile on their front bases. Mantle with a thick, posterior lobe, partially closing the aperture of the shell.

Shell solid, cylindrical, involute; spire none, apex obtuse, umbilicated: aperture narrow and linear, as long as the body-whorl: inner lip callous, with a single, anterior fold; outer lip straight, simple.

Syn. Bullina, *Risso*, not *Férus*. Cylindrella, *Swains.*, not *Pfeiff.* Volvaria, *Brown*, not *Lam.*

Ex. C. cylindracea, *Pennant*, pl. 56, fig. 6. Shell, C. cylindracea, fig. 6, *a*.

The capital disk in *Cylichna* is greatly elongated, and the eyes are sessile near its middle; the shells have the spire completely concealed or involute, so that the apex appears as if perforated, the last whorl is usually cylindrical and convolute, and there is a conspicuous fold on the fore part of the inner lip. The species are chiefly from deep water, and are world-wide in their geographical distribution, being found in the Northern and European Seas, the Philippines, Australia, and North America.

Species of Cylichna.

alba, *Brown.*
arachis, *Quoy and Gaim.*
biplicata, *A. Adams.*
brevissima, *A. Adams.*
concentrica, *A. Adams.*
concinna, *A. Adams.*
conulus, *Desh.*
corticata, *Möll.*
cylindracea, *Penn.*
decussata, *A. Adams.*
involuta, *A. Adams.*
labiosa, *Phil.*
nitidula, *Lovén.*
occulta, *Migh.*
pygmæa, *A. Adams.*
pyramidata, *A. Adams.*
Sarsii, *Phil.*
strigella, *Lovén.*
teres, *Phil.*
triticea, *Couth.*
umbilicata, *Mont.*

Sub-gen. MNESTIA, H. and A. Adams.

Shell ovately cylindrical, marbled or banded, transversely striated; spire conspicuous, immersed in the deep umbilicus of the apex; aperture narrow, acuminately produced both above and below.

bizona, *A. Adams.*
marmorata, *A. Adams.*

Genus UTRICULUS, Brown.

Head-disk very short; tentacular lobes lateral, rounded; eyes none.

Shell rather thin, sub-cylindrical, imperforate, covered with an epidermis; spire distinct, apex obtuse, not mamillated, sutures simple, not canaliculated; aperture narrow behind, dilated and entire in front, nearly as long as the body-whorl; columella simple, not plicate; outer lip, straight, acute.

Syn. Retusa, *Brown.*

Ex. U. obtusus, *Turton*, pl. 56, fig. 7.

These animals appear to delight in slimy mud-banks near the mouths of rivers, where they may be observed, on the retiring of the tide, crawling slowly over the yet moist surface. The animal of the Bornean species, observed by one of the authors, appeared to be devoid of eyes, and to resemble the animal of *Cylichna* rather than that of *Diaphana*, the shells of which those of this genus very much resemble, but are more opaque, cylindrical, and covered with an epidermis; the genus is distinguished from *Tornatina* in the suture of the spire not being channelled, and in the simple inner lip.

Species of Utriculus.

Borneënsis, *A. Adams.*	obtusus, *Turt.*
Cecillii, *Phil.*	pertenuis, *M. ph.*

Genus DIAPHANA, Brown.

Head-disk broad and short; tentacular lobes short, conical, lateral, wide apart; eyes immersed in their hind bases. Mantle-margin slightly thickened. Foot short, bi-lobed behind.

Shell thin, hyaline, sub-umbilicated, inflated, ovate or sub-globose; spire depressed, with a mamillated nucleus; aperture expanded, not extending beyond the body-whorl; columella reflexed and sinuous; outer lip sinuous, produced anteriorly.

Syn. Amphisphyra, *Lovén.*

Ex. D. hyalina, *Turton*, pl. 56, fig. 8. Shell, D. hyalina, fig. 8, *a.*

In this genus, as in the *Rissoella* of Gray, the eyes are placed far back behind the head, so that in order to render the vision of the animal distinct, the shell is nearly transparent. The head of the animal is very short, and the tentacles wide and far apart. The species are few in number, and have been observed in the British, American, and Scandinavian Seas.

Species of Diaphana.

debilis, *Gould.*
globosa, *Lovén.*
Gouldii, *Couth.*
hyalina, *Turt.*

Genus TORNATINA, A. Adams.

Head sub-trigonal; tentacular lobes lateral, triangular, recumbent, with the eyes sessile on their front bases.

Mantle with the outer margin thickened and tri-lobate, the inner edge tapering, and lodged in the channelled suture of the spire. Foot short, linear, anteriorly truncate.

Shell cylindrical or fusiform, involute, covered with an epidermis; spire distinct, produced, apex mamillated, suture canaliculated; aperture narrow, linear; inner lip callous, furnished at the fore part with a single plait; outer lip straight, simple.

Syn. Bullina, *Blainv.*, not *Férus.* or *Risso.*

Ex. T. truncata, *Adams*, pl. 56, fig. 9. Shell, T. voluta, *Quoy and Gaimard*, fig. 9, *a*.

This genus is composed of a group of small shells characterised by their elevated spire, channelled suture, and plicate columella. The animal somewhat resembles that of *Cylichna*, but the head is developed behind into tentacular lobes. The species are inhabitants of deep water, and are of limited locomotive powers, their foot being very short and narrow; they principally come from the Philippines, the China Sea, and the West Indies, while a few are from European seas, two being inhabitants of the British Islands.

Species of Tornatina.

biplex, *A. Adams.*
biplicata, *Migh.*
canaliculata, *Say.*
cinctella, *A. Adams.*
coarctata, *A. Adams.*
fusiformis, *A. Adams.*
gracilis, *A. Adams.*
infrequens, *C. B. Adams.*
mamillata, *Phil.*
obstricta, *Gould.*
olivula, *A. Adams.*
planospira, *A. Adams.*
polita, *A. Adams.*
pusilla, *Pfeiff.*
seminulum, *Phil.*
simplex, *A. Adams.*
truncata, *Adams.*
turrita, *Möll.*
voluta, *Quoy and Gaim.*

Genus VOLVULA, A. Adams.

Shell sub-cylindrical, beaked at both ends; spire none; aperture narrow, linear, extending posteriorly beyond the body-whorl, acuminate in front; inner lip with a single obsolete fold at the fore part; outer lip acute, produced and pointed posteriorly.

Ex. V. rostrata, *A. Adams*, pl. 56, fig. 10.

The animal of this genus is unknown, but it is most probably to be referred to this family. The *Rhizorus* of Montfort, from the figure and description, has a variegated shell with a sunken spire, and appears to be founded on a small species of *Volva*. *Volvula* differs from *Volvaria* in the spire being entirely concealed, and in having but a single fold at the fore part of the inner lip.

Species of Volvula.

acuminata, *Brug.*
angustata, *A. Adams.*
eburnea, *A. Adams.*
rostrata, *A. Adams.*
striatula, *A. Adams.*
mucronata, *Phil.*
granulum, *Phil.*

Fam. BULLIDÆ.

Teeth, central one, lateral numerous, uniform, in an arched series. Animal partly investing, but not entirely covering, the shell. Tentacular frontal disk expanded, emarginate behind; eyes none, or sessile on the middle of the frontal disk. Mantle with the right margin thickened, the left thin, adhering to the body-whorl of the shell. Foot with the sides greatly developed, often reflexed and covering the sides of the shell, or expanded for swimming. Gizzard usually armed with calcareous or horny plates.

Shell external, involute, more or less covered by the reflexed lateral lobes of the foot.

Formerly regarded as a single genus, this extensive, though little-known family, even when dismembered by the separation of the *Aplustridæ*, the *Cylichnidæ*, and the *Philinidæ*, still offers important differences in the structure of the animals of which it is composed. Thus we may contrast the blind *Akera*, with its elongated head, its expanded foot-lobes, and its elastic shell, with the sessile-eyed *Bulla*, with its broad cephalic buckler, its short sub-quadrate foot, and its spotted, solid shell; the amphibious *Smaragdinella*, with its square head, sessile eyes, free foot-lobes, and glaucous ear-like shell, with the eyeless *Scaphander*, with its fleshy, shapeless head-disk, and solid, loosely-involute shell, or again with the Aplysiaform *Cryptophthalmus*, with its eyes concealed under the free lateral margins of the head, and with the ample foot-lobes folded on the back, leaving a branchial aperture at the hind part of the body.

Genus BULLA, Klein.

Eyes conspicuous, sessile on the middle of the frontal disk. Mantle with the outer margin forming a thick, fleshy lobe. Foot with the lateral lobes moderate, and the hind part not extending beyond the shell.

Shell convolute, ovate or sub-globose, smooth, mottled; spire involute, sunken, causing the apex to be tubular or perforate; aperture extending the entire length of the body-whorl; inner lip simple; columella none; outer lip acute.

Syn. Bullus, *Montf.* Ampulla, *Auct.* Cymbium, *Latr.*, not *Klein.* Bullea, *Blainv.* Bullearius, *Dum.* Vesica, *Swains.*

Ex. B. ampulla, *Linnæus*, pl. 57, fig. 1. Shell, B. ampulla, fig. 1, *a*.

The species of this genus inhabit sandy mud-flats, the slimy banks of river-mouths, and brackish places near the sea; at low-water some of them conceal themselves in the mud and under sea-weed, exuding large quantities of mucus to maintain the moisture of their skin; they feed on bivalves and other Mollusca, which they pursue and swallow whole, reducing and crushing them afterwards by the calcareous or horny plates of their powerful, muscular gizzard. The shells of *Bulla*, as restricted, are rather solid, smooth, and marbled and mottled like birds' eggs.

Species of Bulla.

Adamsi, *Mke.*
Adansonii, *Phil.*
ampulla, *Linn.*
amygdalus, *List.*
aspersa, *A. Adams.*
australis, *Quoy and Gaim.*
bifasciata, *Mart.*
columellaris, *Mke.*
cruentata, *A. Adams.*
cypræola, *Mke.*
dactylis, *Mke.*
maculosa, *Mart.*
marginata, *Mke.*
nebulosa, *Gould.*
nux, *Mke.*
oblonga, *A. Adams.*
occidentalis, *A. Adams.*
omphalodes, *Mke.*
Panamensis, *Phil.*
parallela, *Gould.*
perdicina, *Mke.*
perstriata, *Mke.*
punctata, *A. Adams.*
Quoyi, *Gray.*
rubicunda, *Schröet.*
rubiginosa, *Gould.*
rufolabris, *A. Adams.*
solida, *Gmel.*
splendens, *Mke.*
substriata, *Mke.*
sulcata, *Mke.*
tenuicula, *Mke.*

Genus HAMINEA, Leach.

Eyes distinct, sessile on the middle of the head. Mantle with the outer margin large, fleshy, and reflexed on the apex of the shell. Foot with the lateral lobes very

much expanded, covering the sides and front of the shell, the hind part extending beyond the shell.

Shell thin, horny, convolute, elastic, ventricose, ovate or globose, without coloured markings, transversely striated, usually covered with a thin epidermis; aperture narrowed behind, dilated and entire in front; columella none; outer lip simple, acute.

Ex. H. hydatis, *Linnæus*, pl. 57, fig. 2. Shell, H. hydatis, fig. 2, *a*.

In *Haminea* the shell is more invested by the animal than in *Bulla*, so as sometimes to be considered as internal; the shells, moreover, are corneous, thin, fragile, not coloured or spotted, but transversely striated, and covered with a thin epidermis. The species, like those of *Bulla* proper, inhabit the estuaries of rivers, crawling slowly on the slimy mud; they are very voracious, preying chiefly on bivalve Mollusca.

Species of Haminea.

ambigua, *A. Adams.*
brevis, *Quoy and Gaim.*
castanea, *A. Adams.*
cerina, *Mke.*
constricta, *A. Adams.*
curta, *A. Adams.*
cymbalum, *Quoy and Gaim.*
diaphana, *Couth.*
elegans, *Gray.*
exarata, *Phil.* (Sinensis, *A. Adams*).
flavescens, *A. Adams.*
folliculus, *Mke.*
fusca, *A. Adams.*
glabra, *A. Adams.*
Guildingii, *Swains.*
hydatis, *Linn.*
incincta, *Migh.*
insculpta, *Totten.*
luticola, *C. B. Adams.*
Natalensis, *Krauss.*
oryza, *Totten.*
parallela, *Phil.*
papyrus, *A. Adams.*
pemphis, *Phil.*
rotundata, *A. Adams.*
succinea, *Conr.*
tenella, *A. Adams.*
tenera, *A. Adams.*
virescens, *Sow.*
vitrea, *A. Adams.*

Genus AKERA, O. F. Müller.

Head-disk elongated, entire behind; eyes none. Mantle with a fimbriated edge projecting through the slit in the spire. Foot with the lateral lobes greatly dilated, folded, in repose, over the sides of the shell.

Shell convolute, ovate or sub-cylindrical, ventricose, thin, elastic; spire truncated, the whorls distinct, channelled, the last whorl disjoined from the others at the suture; aperture elongate, pyriform, rounded and entire in front; inner-lip excavated; outer lip posteriorly free, angulated.

Syn. Acera, *Latr.*, not *Albers.* Eucampe, *Leach.* Vitrella, *Swains.*

Ex. A. soluta, *Chemnitz*, pl. 57, fig. 3. Shell, A. soluta, fig. 3, *a.*

In this genus the head-disk is greatly elongated, wide and bifid anteriorly, and narrowed posteriorly; the hind edge of the mantle is fimbriated and projects through the fissured suture of the shell, the foot is expanded, narrow and rounded anteriorly, and broad and truncated posteriorly; by means of the extended lateral foot-lobes the animal, like *Aglaia*, swims with considerable facility, but when crawling, the foot, as in that genus, is folded over the back.

Species of Akera.

bicincta, *Quoy and Gaim.*
bullata, *Müll.*
soluta, *Chem.*
subangulata, *Möll.*
tenuis, *A. Adams.*
tumida, *A Adams.*

Genus SCAPHANDER, Montfort.

Animal not investing the shell. Eyes none. Foot ample, but short, the side-lobes small.

Shell ovato-pyriform, convolute; spire distinct, depressed, somewhat concealed; aperture very wide, narrowed behind, entire and dilated in front; inner lip spirally convoluted as far as the commencement of the spire; outer lip simple, acute.

Syn. Assula, *Schum.* Bullæa, *Roissy*, not *Lam.* Bulla, *Swains.*, not *Klein.*

Ex. S. lignarius, *Linnæus*, pl. 57, fig. 4. Shell, S. lignarius, fig. 4, *a*.

The gizzard of *Scaphander* is armed with three calcareous plates, two of which are large, flat and sub-circular, and the third is much smaller. Gioëni, an Italian Naturalist, made out of this gizzard an imaginary genus of Mollusks, which he named *Gioënia* after himself, and even went so far as to describe the habits of the fictitious animal. The supposed genus, also named *Tricla* by Retzius, was adopted by Lamarck and by Cuvier, the latter of whom regarded it as a sub-genus of *Pholas;* the imposition, however, was detected and exposed by the illustrious Draparnaud, who first proved the real nature of the imaginary creature.

Species of Scaphander.

librarius, *Lovén.*
lignarius, *Linn.*
lineolatus, *Couth.*
puncto-striatus, *Migh.*
scaber, *O. Müll.*
vestitus, *Phil.*

Genus ATYS, Montfort.

Eyes none, or sub-cutaneous on the middle of the cephalic disk, which is bi-lobed behind. Mantle with the right margin thickened, truncate and reflexed on the spire.

Shell white, solid, colourless, convolute, more or less transversely striated, sometimes covered with a thin epidermis; spire hidden, involute; aperture narrow behind, dilated in front; columella ending anteriorly in a fold, tooth, or truncature; outer lip posteriorly twisted and produced.

Syn. Naucum, *Schum.* Alicula, *Ehrenb.* Roxana, *Leach.*

Ex. A. Cranchii, *Leach*, pl. 57, fig. 5. Shell, A. naucum, *Linnæus*, fig. 5, *a*.

The shells in this genus are solid, white, and transversely striated; the inner lip is more or less truncate, and the hind part of the outer lip is produced and spirally contorted. The animals appear to be either totally blind, or to have the eyes sub-cutaneous. The Philippine Islands, Ceylon, Australia, and America harbour species of this genus, and one is found in the British Isles.

Species of Atys.

alicula, *A. Adams.*
Cranchii, *Leach.*
cylindrica, *Helb.*
elongata, *A. Adams.*
exigua, *A. Adams.*
ferruginosa, *Chem.*
hordacea, *A. Adams.*
naucum, *Linn.*
obovata, *Mke.*
ovoidea, *Quoy and Gaim.*
ovulata, *Brocc.*
parvula, *A. Adams.*

solida, *Brug.*
speciosa, *A. Adams.*
succisa, *Ehrenb.*
tortuosa, *A. Adams.*
truncatula, *Brug.*

Sub-gen. DINIA, H. and A. Adams.

Shell ovoid, posteriorly sub-truncated, longitudinally striated; inner lip strongly truncated, and ending anteriorly in a dentiform plate.

dentifera, *A. Adams.*
monodonta, *A. Adams.*
nonscripta, *A. Adams.*

Sub-gen. SAO, H. and A. Adams.

Shell pyriform, gibbose anteriorly, umbilicated; apex truncate, impressed, not perforate; aperture contracted posteriorly, greatly dilated in front; columella reflexed, not truncate; outer lip produced and angulated behind.

pyriformis, *A. Adams.*

Genus PHYSEMA, H. and A. Adams.

Shell small, hyaline, globose, umbilicated, fragile, longitudinally finely striated; spire none; aperture narrow posteriorly, greatly dilated anteriorly; columella somewhat arcuated, reflected; outer lip acute, free posteriorly, dilated in the middle.

Ex. P. hiemalis, *Couthouy*, pl. 57, fig. 6.

This genus is founded on a small, but very peculiarly formed shell, having somewhat the appearance of *Akera* or *Lophocercus*, but which appears to be sufficiently different from either. It has been procured chiefly, hitherto, from the stomachs of codfish in Massachussetts Bay, and the animal has not been observed.

Genus SMARAGDINELLA, A. Adams.

Animal partially investing the shell. Eyes sessile on the middle of the frontal disk. Mantle included within the shell, ending posteriorly in a thickened lobe. Foot with the side-lobes free, not united to the head, enlarged in the form of wings which unite behind and cover a portion of the shell.

Shell oval, depressed, slightly convolute, green or glaucous; aperture very wide, canaliculated posteriorly; inner lip with a cup-shaped appendage, spiral within.

Syn. Linteria, *A. Adams.* Glauconella, *Gray.* Thecaphorus, *Nutt.*

Ex. S. viridis, *Rang*, pl. 57, fig. 7. Shell, S. viridis, fig. 7, *a*.

The lateral lobes of the foot being free and unconnected with the head in front, the form of the cephalic buckler or head-disk, and the cup-shaped lamina arising from the apex and ending on the columellar margin of a depressed, open shell, will serve to distinguish this genus. The animal is amphibious in its habits, living on moist rocks within reach of the spray, and on rocks weeping fresh-water near the sea-shore. Both animal and shell are of a glaucous green colour.

This genus was first characterised and published by one of the authors in 1848, in the appendix to Sir Edward Belcher's "Narrative of the Voyage of H. M. S. Samarang," p. 475, under the name of *Smaragdinella*. It was afterwards published in Sowerby's Thesaurus Conchyliorum, together with *Phanerophthalmus* and *Chelidonura*, in the beginning of 1850, under the name of *Linteria*, by the

same author, and during the latter part of that year (August 1850) under the name of *Glauconella* by Dr. Gray. The name we have used therefore bears priority, the term '*Thecaphorus*' being a manuscript name of Nuttall.

Species of Smaragdinella.

glauca, *Quoy and Gaim.* viridis, *Rang.*
minor, *A. Adams.*

Sub-gen. NONA, H. and A. Adams.

Shell internal, sub-trigonal, slightly involute, white, fragile; inner lip with a cup-shaped appendage, sub-spiral within; outer lip expanded, angulated and produced posteriorly.

Algiræ, *Hanley.*

Genus CRYPTOPHTHALMUS, Ehrenberg.

Body semi-cylindrical, in form like an *Aplysia* without tentacles. Head depressed, fleshy, the margins free; eyes small, lateral, under the free margins of the head-disk. Mantle covering only the base of the shell. Foot with two lateral wing-like lobes, reflexed and folded over the back, involving the whole body, and forming a branchial aperture at the hind part.

Shell scarcely involute, horny, fragile, destitute of columella and spire; aperture wide.

Ex. C. olivaceus, *Ehrenberg*, pl. 58, fig. 1. Shell, C. olivaceus, fig. 1, *a*, 1, *b*.

The animal of the only species of this genus known is of a fine emerald-green colour, and has been described

by Leuckart and Rüppell under the name of *Bulla smaragdina*. M. Ehrenberg does not inform us whether the breathing aperture formed by the folding back of the lobes of the foot at the hind part of the body is persistent, as in the *Aplysiæ*, or whether the lobes are laterally expanded and unfolded so as to enable the animal to swim through the water.

Fam. PHILINIDÆ.

Teeth, central none; lateral one or two, large, hooked. Cephalic disk, oblong or sub-quadrate, without tentacular lobes; eyes none, or, if present, sessile on the head. Mantle covering and concealing the shell. Foot not produced posteriorly, the sides dilated, thick and fleshy. Gizzard armed with calcareous plates.

Operculum none.

Shell none, or internal, enclosed in the mantle; when present, loosely involute.

This family, as at present constituted, appears to comprise a somewhat incongruous assemblage. The animals have a single branchial plume, protected by the mantle, and a rudimentary shell, are hermaphrodite, and their gizzard is strengthened with calcareous plates. They are predaceous, and swallow their prey entire, crushing the shells of the Mollusks on which they feed by means of their muscular gizzards.

Genus PHILINE, Ascanias.

Animal investing the shell. Eyes none. Foot not produced posteriorly, the side-lobes large and fleshy.

Shell concealed in the mantle, loosely convolute, thin, fragile, sub-orbicular or ovate, striate or punctate; spire small, often concealed; aperture very wide and open; outer lip patulous.

Syn. Lobaria, *Müll.* Amygdala marina, *Planc.* Bullæa, *Lam.* Phyline, *Voight.* Philina, *Lam.*

Ex. P. aperta, *Linnæus*, pl. 57, fig. 8. Shell, P. aperta, fig. 8, *a*.

The animals composing this genus are blind, like most creatures that seek their food by burrowing. They frequent mud-flats and slimy banks at the entrances of rivers, which they perforate near the surface, and probe with their flattened heads for the small bivalves which constitute their prey; these they seize and swallow entire, breaking their shells by means of their testaceous, muscular gizzards.

Species of Philine.

aperta, *Linn.*
catena, *Mont.*
Coreanica, *A. Adams.*
formosa, *Stimp.*
orientalis, *A. Adams.*
quadrata, *S. Wood.*
pruinosa, *Clark.*
punctata, *Adams.*
Schrœteri, *Phil.*
scutulum, *Lovén.*
sinuata, *Stimp.*

Genus PHANEROPHTHALMUS, A. Adams.

Body elongated. Head-disk dilated at the sides in front, bi-lobed behind; eyes sessile on the upper surface. Mantle covering the shell. Foot with the side-lobes dilated, folded on the back, not united, but leaving between them a longitudinal fissure.

Shell concealed in the interior of the back above the gill, oval, entirely open, without more trace of a spire than a curved process at the left margin; outer lip posteriorly prolonged into a point slightly turned on itself.

Syn. Xanthonella, *Gray*.

Ex. P. luteus, *Quoy and Gaimard*, pl. 58, fig. 2. Shell, P. luteus, fig. 2, *a*.

Such is the description given of this genus by the Naturalists of the "Astrolabe," who discovered the animal on the reefs at Port Dorey, New Guinea, and named it, on account of its uniform pale yellow colour, *Bulla lutea*. M. Quoy further observes, that the animal both crawls and swims, and that the shell, concealed in the interior of the back, above the gill, approaches more to the Dolabellas than to the Bullas. The position of the eyes at once distinguishes this genus from the *Cryptophthalmus* of Ehrenberg, with which it exhibits perhaps the greatest affinity.

Genus CHELIDONURA, A. Adams.

Head elongated, with three setigerous lobes in front, not bi-lobed posteriorly, but produced into a single, lanceolate, tongue-like lobe, which is extended over the back; eyes none. Mantle prolonged posteriorly into a long bifurcate tail. Foot very large, dilated on each side, reflexed and embracing the head and mantle, pointed at the sides in front, rounded behind.

Shell concealed in the thickness of the mantle, flat, thin, very open, scarcely involute, without spire or columella; outer lip produced posteriorly into a long, curved process.

Syn. Hirundinella, *Gray*.

Ex. C. hirundinina, *Quoy and Gaimard*, pl. 58, fig. 3. Shell, C. hirundinina, fig. 3, *a*, 3, *b*.

M. Quoy observes, that the animal on which this genus is founded, swims by the aid of its mantle, which was the case with a beautiful species observed by one of the authors, also in the Mauritius, but which was so mutilated in the dredge, as only to afford the information, that it was distinct from *C. hirundinina*. The individual alluded to by M. Quoy, which "had the back crossed with white, and all the blue lines bordered with a line of gold," was probably a third species. We have examined a shell which agrees with M. Quoy's species, and which was found among the shells of *Aplysiæ* in Mr. Cuming's Collection.

Genus AGLAIA, Renier.

Body depressed, posteriorly truncate. Head-disk ovate, oblong, anteriorly retuse; eyes none. Mantle large, oblong, shorter than the foot; gill on the right side of the body. Foot expanded, ovately rounded, produced anteriorly into a fleshy lobe.

Shell internal, rudimentary, flat, triangular.

Syn. Doridium, *Meckel.* Eidothea, *Risso.* Bullidium, *Meckel.* Bullula, *Agass.* Akera, *Cuv.*, not *Müll.* Acera, *Lam.* Lobaria, *Blainv.*, not *Müll.*

Ex. A. lineolata, *H. and A. Adams*, pl. 58, fig. 4. Shell, A. depicta, *Renier*, fig. 4, *a*.

This genus differs from the *Posterobranchæa* of M. D'Orbigny in the branchial plume being situated on the right side of the body towards the hind part. The *Eidothea marmorata* of Risso, or the *Doridium aplysiæforme* of Chiaje, is the same as the *Aglaia depicta* of

Renier; and the *Doridium membranaceum*, of Mecke or *D. Meckelii*, of Chiaje, is the *Aglaia tricolorata* Renier. The new species we have figured was discovered by Mr. Gould in Australia.

Species of Aglaia.

depicta, *Renier*. tricolorata, *Renier*.
lineolata, *H. and A. Adams*.

Genus POSTEROBRANCHÆA, D'Orbigny.

Cephalic disk transverse, dilated at the sides; eyes none. Mantle large, extending beyond the foot, except posteriorly; gill on the left side of the body. Foot divided into two parts by a deep, transverse groove; the hind part longitudinally fissured and divided into two lobes.

Shell none.

Syn. Posteobranchus, *D'Orb.* (olim). Posteriobranchus, *Gray*.

Ex. P. maculata, *D'Orbigny*, pl. 58, fig. 5, 5, *a*.

As in *Aglaia* and other genera belonging to this group, the tentacles are confounded with the large, persistent, frontal veil, forming a fleshy cephalic disk or frontal lobe; the present genus seems to differ from all the others of the family, in the branchial plume being situated on the left side. The genus has greater affinities with *Aglaia* than with *Pleurobranchus*, near which its author considered it should be placed; it was discovered by M. D'Orbigny, crawling on the muddy sand-flats of the shores of South America, and has the same habits, and lives at the same depths as *Aplysia*.

Genus GASTEROPTERON, Meckel.

Head-disk triangular, with the eyes sessile on its upper surface. Body ovate, bursiform. Branchial plume exposed, on the right side of the body. Foot produced on each side into a very large, rounded, fin-like lobe, which, in repose, is folded over the back.

Syn. Parthenopia, *Oken*. Sarcopterus, *Rafin*. Opiptera, *Rafin*. Gasteroptera, *Blainv*.

Ex. G. Meckelii, *Kosse*, pl. 58, fig. 6.

This genus has been classed by some Zoologists with the Pteropods, and has been described by Chiaje as a species of *Clio*. One species only is known, an inhabitant of the Mediterranean. There is no shell, and the side-lobes of the foot form, by their union, a transversely-ovate expansion, retuse and slightly emarginate in front, and produced in the middle; by the aid of this fin-like organ the animal is enabled to swim freely about; when, however, it wishes to crawl, the side-lobes are elevated and applied against each other over the back, in which condition the animal somewhat resembles an *Aplysia*.

Genus ATLAS, Lesueur.

Animal divided into two parts united by a peduncle, the posterior oval, the anterior circularly dilated, with the margins ciliated, and with a pair of small, auriform, tentacular lobes above, and a very small, distinct foot below.

Ex. A. Peronii, *Blainville*, pl. 58, fig. 7.

This genus is not very well known. M. Lesueur, who

discovered it, believed the organs of respiration to consist in the cilia, which fringe the fore-part of the body; but M. Blainville thinks the gill, unobserved, must have been situated on the right-side, as in the genus *Gasteropteron*.

Fam. LOPHOCERCIDÆ.

Head with two ear-like tentacles; eyes sessile on the sides of the head. Gill regular, pectinate. Organs of generation close together in one tubercle; male organ on the right side of the nape near the tentacle.

Shell thin, involute, covered with an epidermis.

Two fossil forms have been discovered by Dr. Philippi in the Tertiary formation near Palermo, which he observes cannot be referred to any existing genus, but which possibly belonged to animals closely allied to those of this family. These extinct shells have received the names of *Aplysia? grandis*, Phil. and *A.? deperdita*, Phil.

Genus LOPHOCERCUS, Krohn.

Body covered with papillæ, and produced behind into a long, pointed tail. Foot with the natatory appendages undivided, reflexed and partly covering the shell in front, and united posteriorly.

Shell involute, thin, ovate, covered with an epidermis; the outer lip separated from the last whorl, its hinder angle inflexed, produced and rounded.

Syn. ? Icarus, *Forbes*.

Ex. L. Sieboldii, *Krohn*, pl. 59, fig. 1. Shell, L. Sieboldii, fig. 1, *a*.

In this curious genus the head is truncate, and is

furnished at the angles with two ear-shaped tentacles, but the labial tentacles, so conspicuously developed in *Aplysia*, appear to be entirely wanting. The side-lobes of the foot, which some regard as the mantle, are separated in the middle of the back, so as partially to expose the involute Bulla-like shell; the tail is very long and compressed, and the orifices of the organs of reproduction are close together, in a single tubercle, near the right tentacle.

Species of Lophocercus.

pellucidus, *A. Adams.* Sieboldii, *Krohn.*

Genus LOBIGER, Krohn.

Body produced posteriorly into a long, pointed tail, covered with papillæ. Foot with the natatory appendages in the form of dilated, rounded lobes, two on each side.

Shell thin, transparent, covered with an epidermis; spire rudimentary, in the form of a protuberance directed towards the left.

Ex. L. Philippii, *Krohn*, pl. 59, fig. 2. Shell, L. Philippii, fig. 2, *a*.

In general organization the animal of this genus closely resembles that of *Lophocercus*, from which, however, it differs in the body being provided with four lateral, expanded, wing-like lobes, and in the simple, ovate shell, which is not elastic and involute as in that genus.

Species of Lobiger.

Cumingii, *A. Adams.* Philippii, *Krohn.*
Krohnii, *A. Adams.*

Fam. APLYSIIDÆ.

Teeth, central, one; lateral, numerous, similar. Head with separate, ear-like tentacles; eyes sessile on the head; mouth armed with horny jaws, and with produced labial tentacles. Mantle with an internal calcareous plate protecting the gill. Foot with large lateral lobes, usually folded across the back.

Shell rudimentary, internal, contained in the mantle.

The gizzard is armed with cartilaginous plates in this family; the reproductive orifices are beneath the tentacle on the right side, and the vent is dorsal, and is either sessile or tubular.

Genus DOLABELLA, Lamarck.

Body elongated, with an oblique disk on the hind part; gills concealed; lobes of the foot not dilated for swimming.

Shell internal, uniform, calcareous, triangular, with the apex callous.

Syn. Operculum callosum, *Rumph.*

Ex. D. scapula, *Martyn*, pl. 59, fig. 3. Shell, D. scapula, fig. 3, *a*.

The *Dolabellæ* are inhabitants of the Indian Ocean; they prefer a bottom of sandy mud, and often associate together in considerable numbers; they vary in colour according to individual specimens, some being dark olive-green, and others quite pink.

Species of Dolabella.

ecaudata, *Rang.*

fragilis, *Lam.*

gigas, *Rang.*
Hasseltii, *Rang.*
scapula, *Martyn.*
Teremidi, *Rang.*
truncata, *Rang.*

Genus DOLABRIFERA, Gray.

Body tapering, with no disk on the hind part; gills concealed. Foot with the lobes covering the back, not dilated for swimming.

Shell internal, calcareous, trapeziform or sub-quadrangular; apex produced.

Syn. Petalifera, *Gray.*

Ex. D. Cuvieri, *H. and A. Adams*, pl. 59, fig. 4. Shell, D. Cuvieri, fig. 4, *a*.

The body, in this genus, appears to want the transverse, fimbriated crest, situated towards the hind part, seen in *Dolabella*, and the shell, although calcareous, is trapeziform with the apex produced, and not triangular with a callous apex, as in the last-named genus.

Species of Dolabrifera.

ascifera, *Férus.*
Cuvieri, *H. and A. Adams* (A. dolabrifera, *Cuv.*).
petalifera, *Rang.*
unguifera, *Rang.*

Genus APLYSIA, Gmelin.

Body elongated. Gills concealed. Foot with the lobes dilated and serving for swimming. Anal aperture simple, sessile.

Shell internal, sub-cartilaginous, ovate; apex acute.

Syn. Lernea, *Linn.* Tethys, *Linn.* Lepus marinus, *Rond.* Esmia, *Leach* (young).

Ex. A. hybrida, *Sowerby*, pl. 59, fig. 5. Shell, A. depilans, *Linnæus*, fig. 5, *a*.

When molested, the *Aplysiæ* pour out an abundance of a beautiful purple fluid, so that one of them alone can colour the water for some yards around it; Cuvier states that they are herbivorous.

Species of Aplysia.

alba, *Cuv.*
Argus, *Rüpp.*
Braziliana, *Rang.*
Brugnatelli, *Van Ben. and Robb.*
camelus, *Cuv.*
dactylomela, *Rang.*
depilans, *Linn.*
depressa, *Cantr.*
Dumortieri, *Cantr.*
fasciata, *Poiret.*
Férussacci, *Rang.*
fimbriata, *Adams and Reeve.*
fusca, *Tilesius.*
Gouldii, *H. and A. Adams* (fimbriata, *Gould*).
hybrida, *Sow.*
Inca, *D'Orb.*
Julienna, *Quoy and Gaim.*
lepus, *Risso.*
Lessonii, *Rang.*
limacina, *Rang.*
lineolata, *Adams and Reeve.*
linguifera, *Rang.*
longicornis, *Rang.*
marginata, *Blainv.*
Neapolitana, *Chiaje.*
nigra, *D'Orb.*
nodifera, *Adams and Reeve.*
oculifera, *Adams and Reeve.*
Poliana, *Chiaje.*
protea, *Rang.*
punctata, *Cuv.*
Rangiana, *D'Orb.*
rosea, *Rathke.*
Sicula, *Swains.*
sorex, *Rang.*
tigrina, *Rang.*
virescens, *Risso.*
Webbii, *Van Ben. and Robb.*

Genus SYPHONOTA, H. and A. Adams.

Body elongated. Foot with the side-lobes adapted for swimming. Anal aperture prolonged into a tube.

Shell internal, thin, ovate, nearly membranaceous; apex acute.

Syn. Aplysia sp. *Rang.* Siphonotus, *Adams and Reeve*, not *Brandt.*

Ex. S. geographica, *Adams and Reeve*, pl. 59, fig. 6.

Occasionally, and especially during low-water, the species of *Syphonota* bury themselves in the mud on shallow shores; some species, however, are met with at a considerable distance from land, among floating algæ.

Species of Syphonota.

fasciata, *Poiret.*
geographica, *Adams and Reeve.*
Keraudrenii, *Rang.*
lurida, *D'Orb.*
maculata, *Rang.*
ocellata, *D'Orb.*

Genus ACLESIA, Rang.

Body oval, pointed behind, covered with digitated appendages; gills included within the branchial cavity. Anal orifice simple.

Shell none.

Syn. Aclesie, *Rang.* Thallepus, *Swains.*

Ex. A. Pleii, *Rang*, pl. 59, fig. 7.

Aclesia differs from *Aplysia* in the entire absence of shell, in the lobes of the foot being less developed, and in the body being usually beset with numerous, branched, tentacular appendages.

Species of Aclesia.

cirrigera, *Quoy.*
citrina, *Rang.*
euchlora, *A. Adams.*
ocellata, *A. Adams.*
Pleii, *Rang.*
rufa, *Quoy.*
striata, *Quoy.*
viridis, *Rang.*
undata, *Rang.*

Genus NOTARCHUS, Cuvier.

Body oval. Head with the posterior tentacles simple and conical. Gills protruding from the branchial cavity. Foot linear, narrow.

Shell none.

Syn. Busiris, *Risso.* ? Placobranchus, *Rang.*

Ex. N. gelatinosus, *Rang*, pl. 60, fig. 1.

The species of this genus live in floating masses of seaweed, and those with dilated feet swim by vertical movements of the lobes.

Species of Notarchus.

Cuvieri, *Blainv.*
gelatinosus, *Rang.*
griseus, *Risso.*
ocellatus, *Rang.*
punctatus, *Phil.*

Genus BURSATELLA, Blainville.

Body globular, covered with unguiform appendages. Head with the posterior tentacles ramified. Gills external, long and plumose.

Shell none.

Syn. Notarchus, *Swains.*, not *Cuvier.*

Ex. B. Leachii, *Blainville*, pl. 60, fig. 2.

In this genus the body is almost spherical, the mantle opening is small, and the lateral lobes of the foot are not developed; there is no shell, and the four cloven tentacles are beset with filiform appendages; the branchial plume, moreover, is very long and exserted. Possibly this form may be identical with that of *Aclesia*, but from being preserved in spirits may have assumed a globular shape.

Species of Bursatella.

laciniata, *Rüpp.* Leachii, *Blainv.*

Genus STYLOCHEILUS, Gould.

Body limaciform, cirrhigerous, dilated at the sides, attenuated posteriorly. Head separated from the body by a distinct neck; tentacles four, elongated, linear, more or less papillose, wide apart; mouth inferior, the lips dilated laterally into an acutely-conical tentacular process.

Ex. S. longicauda, *Quoy and Gaimard*, pl. 60, fig. 3.

The papillose tentacles, and the peculiar lateral extension of the lips, are the chief features of this genus; the body, moreover, is prolonged behind into an acute, tapering, tail. The four tentacles are quite distinct from the elongate labial processes.

Species of Stylocheilus.

lineolatus, *Gould.* quercinus, *Gould.*
longicauda, *Quoy and Gaim.*

Fam. PLEUROBRANCHIDÆ.

Head with auriform tentacles; eyes sessile on the head, at the bases of the tentacles; mouth provided with an oral veil, corneous jaws, and an armed lingual riband. Gills composed of a double row of leaflets in the form of a long branchial plume at the side of the body under the edge of the mantle.

Shell calcareous and external; membranous and internal; or, rarely, altogether wanting.

The animals of this family have no upper jaw; the lingual membrane is armed with numerous short teeth, arranged in a quincunx; there are four stomachs, the second of which is fleshy and sometimes furnished with bony pieces, and the third is provided internally with prominent longitudinal lamellæ; the intestinal canal is short. The species of this group are tolerably numerous, occasionally of large size and adorned with varied colours; they are mostly inhabitants of the high seas.

Sub-fam. PLEUROBRANCHINÆ.

Mantle covering and concealing the shell.

Shell, internal and rudimentary, membranous, or altogether wanting.

Genus PLEUROBRANCHUS, Cuvier.

Tentacles dorsal, ear-like; labial appendages transverse, folded, and truncate. Mantle smaller than the foot, only partly covering the head, simple behind. Foot very large, extending beyond the mantle.

Shell internal, convex, thin, oval, membranaceous.

Syn. Berthella, *Blainv.* Discoides, *Renier.* Cleanthus, *Leach.*

Ex. P. citrinus, *Rüppell*, pl. 60, fig. 4, 4, *a*. Shell, P. plumula, *Montagu*, fig. 4, *b*.

The *Pleurobranchi* live in families, under large stones, in shallow water; they feed on the sea-weed that grows

around them, which their complex stomachs seem well calculated to digest, and they are very slow in their movements.

Species of Pleurobranchus.

aurantiacus, *Risso.*
Blainvillii, *Lesson.*
brevifrons, *Phil.*
citrinus, *Rüpp.*
cornutus, *Quoy and Gaim.*
De Haanii, *Cantr.*
Forskälii, *Chiaje.*
mamillatus, *Quoy and Gaim.*
oblongus, *Savigny.*
ocellatus, *Chiaje.*
Patagonicus, *D'Orb.*
perforatus, *Phil.*
plumula, *Mont.*
Peronii, *Cuv.*
punctatus, *Quoy and Gaim.*
stellatus, *Risso.*
tuberculatus, *Chiaje.*

Genus OSCANIUS, Leach.

Tentacles dorsal, irregular, ear-like; labial processes broad and triangular. Mantle smaller than the foot, entirely concealing the head, fissured in front and behind. Foot large, thin, foliaceous.

Shell internal, large, thin, membranous, flattened, orbicular, with a postical apex.

Ex. O. dilatipes, *H. and A. Adams,* pl. 60, fig. 5, 5, *a.* Shell, O. membranaceus, *Montagu,* fig. 5, *b.*

The *Oscanius* we have figured is pale red, with deep, red-brown, depressed lines, and light pink tubercles surrounded by dark red-brown zones; the foot is flesh-coloured, with faint concentric striæ. (In spirits in Mr. Cuming's Collection.)

Species of Oscanius.

dilatipes, *H. and A. Adams.*
Lesueurii, *Blainv.*
membranaceus, *Mont.*

Genus NEDA, H. and A. Adams.

Tentacles dorsal, truncate; labial appendages transversely prolonged, acuminate, united anteriorly, and forming a large, semilunar, oral veil. Mantle small, with a truncate anal siphon on the hinder dorsal surface. Foot very large, extending beyond the mantle, rounded behind, truncate in front.

Shell none.

Syn. Pleurobranchus, sp. *Cuvier.*

Ex. N. luniceps, *Cuvier*, pl. 61, fig. 1, 1, *a*.

In this genus the oral veil is laterally dilated, forming a large semilunar shield over the proboscis, with the sides produced and angulated; the mantle is small and covers only the dorsal region, and the vent appears to be tubular and situated centrally at the hind part of the back.

Genus PLEUROBRANCHÆA, Meckel.

Tentacles dorsal; eyes none; labial appendages united by a narrow, transverse, oral veil. Mantle indistinct, indicated by a narrow band on the right side; anal orifice above the gill. Foot narrow.

Shell none.

Syn. Pleurobranchus, *Oken*, not *Cuv.* Cyanogaster, *Rudolphi.* Pleurobranchidium, *Blainv.*

Ex. P. Meckelii, *Leve*, pl. 61, fig. 2, 2, *a*.

In this genus the mantle-margin is not so developed as in *Pleurobranchus*, and does not extend beyond the foot; the plume-like gill is not so prominent, and is less deeply divided; there is no indication of a shell, and the vent is situated above, and not behind, the gill.

Sub-fam. OPERCULATINÆ.

Mantle lining the shell.

Shell external, limpet-like, calcareous or horny.

Genus OPERCULATUM, Linnæus.

Tentacles dorsal, ear-like, with plicate cavities at their bases; mouth proboscidiform, retractile, covered by a small oral veil with moderate labial appendages, and concealed in the notch at the fore part of the foot. Foot large and thick, deeply fissured in front, the sides tubercular.

Shell external, calcareous, orbicular, flattened, with a slightly-raised, conical, sub-central apex; margin acute, simple.

Syn. Umbrella, *Lam.* Acardo, *Lam.* Umbraculum, *Schum.* Gastroplax, *Blainv.* Ombrella, *Blainv.* Umbella, *Chem.*

Ex. O. Mediterraneum, *Lamarck*, pl. 61, fig. 3. Shell, O. læve, *Linnæus*, fig. 3, *a*.

The great peculiarity in this genus is the fact of the head being sunk into a deep fissure or cavity in the front part of the foot. The vent is tubular and posterior, and the organs of reproduction are anterior to the tentacles.

Species of Operculatum.

Chinense, *Chem.*
læve, *Linn.*
Lamarckianum, *Recluz.*
Mediterraneum, *Lam.*
pictum, *A. Adams.*

Genus TYLODINA, Rafinesque.

Tentacles dorsal, ear-like, with the eyes sessile at their outer bases; labial appendages lanceolate, united by a veil, emarginate in front. Foot strong, thick, ovate, truncate in front.

Shell external, membranous, oval, conical, with a callous, sub-central, recurved apex of about two whorls.

Ex. T. punctulata, *Rafinesque*, pl. 61, fig. 4. Shell, T. punctulata, fig. 4, *a*.

Tylodina differs from *Operculatum* in the head being produced and bifid, and in the membranous structure of the shell. Of this genus there are three species already described, two of which are inhabitants of the Mediterranean, and one is a native of the coast of Norway.

Species of Tylodina.

citrina, *Joannis*.
Duebenii, *Lovén*.
punctulata, *Rafin*.

Fam. RUNCINIDÆ.

Tongue-membrane armed with three series of teeth, the central broad, transverse, with the upper edge reflexed, notched in the middle, and denticulate on each side; the lateral large, versatile, conic, arched, compressed, with an acute tip. Cephalic disk flat, broad, and sub-quadrangular; the eyes sessile on its upper surface. Mantle distinct, oblong; gills slightly pinnate, at the hinder part under the edge of the mantle on the right side. Vent central, on the

posterior portion of the back beneath the margin of the mantle. Generative organs on the right side.

Shell none.

These animals appear to partake of the characters of the *Pleurobranchidæ* and *Bullidæ*, and to form, with the Phyllidians, a transition group between the Tectibranchiate and Nudibranchiate Gasteropods; in the position of the gills they approach the *Pleurobranchidæ*, but they have no tentacles, and in the peculiar testaceous gizzard and frontal lobe they resemble the *Bullidæ*.

Genus RUNCINA, Forbes.

Body depressed, limaciform, smooth. Tentacles none; eyes sessile on the broad cephalic disk. Mantle distinct, oblong, tough.

Shell none.

Syn. ? Pelta, *Quatrefages* (young), not *Beck*.

Ex. R. Hancocki, *Forbes*, pl. 61, fig. 5.

This curious little genus is probably the same as the *Pelta* of Quatrefages, which is described as having a similar armed gizzard, and may have been founded on a young specimen of *Runcina*, in which state the gills are possibly not apparent. The only species known is found in pools left at low water, where they are seen crawling on the tufts of *Hypnea purpurascens* infested with *Diatomaceæ* upon which they probably subsist.

Species of Runcina.

? coronata, *Quatref.* Hancocki, *Forbes.*

Fam. PLEUROPHYLLIDIIDÆ.

Tongue broad; teeth, many in each cross series; jaws horny; tentacles simple, united, expanded. Gills in folds on the under side of the edge of the mantle, which is bent up. Vent lateral, posterior.

In the singular animals of which this family is composed there is no shell, the orifices of generation are in a common tubercle on the right anterior side, and the vent is at the right posterior side of the body; the tentacles, moreover, are dilated and connate, forming a frontal veil.

Genus PLEUROPHYLLIDIA, Meckel.

Body depressed. Head partially concealed by the mantle; tentacles dilated and connate, forming by their union a broad, transverse, frontal veil. Mantle large, expanded, smooth, simple above.

Syn. Diphyllidia, *Cuvier.* Linguella, *Blainv.* Armina, *Rafin.*

Ex. P. lineata, *Otto,* pl. 68, fig. 3.

The lamellated gills occupy the two posterior thirds of the under margin of the mantle. A remarkable feature of the animal is the broad veil formed by the expanded tentacles. There are two species from the Mediterranean, and two from tropical seas.

Species of Pleurophyllidia.

lineata, *Otto.*
ocellata, *Cuv.*
pustulosa, *Phil.*
rubida, *Gould.*
verrucosa, *Cantr.*

Fam. PHYLLIDIIDÆ.

Tongue and jaws none; tentacles dorsal, anterior, retractile; labial palps close together, conical, small. Gills in the form of radiating folds on the under side within the edges of the mantle. Vent median, posterior.

The tentacles in this family are dorsal and retractile like those of *Doris*, and the vent is on the middle of the hind part of the back. In the disposition of the gills, which are in the form of oblique lamellæ disposed round the body under the edge of the mantle, these animals resemble the *Chitonidæ*.

Genus PHYLLIDIA, Cuvier.

Body depressed, oval. Labial palps small, distinct, slender. Mantle hard, convex, smooth. Vent dorsal, in the middle of the hinder part of the back.

Syn. Phyllide, *Swainson*.

Ex. P. trilineata, *Cuvier*, pl. 68, fig. 4.

The head in this genus is small, and concealed under the front of the coriaceous mantle; the mouth is proboscidiform, without jaws or tongue; the dorsal tentacles are retractile into cavities; and the buccal appendages are small, distinct, and slender. The position of the vent, and the smooth mantle, distinguish this genus from *Fryeria*.

Species of Phyllidia.

albonigra, *Quoy and Gaim.*
annulata, *Gray.*
Arabica, *Ehrenb.*
trilineata, *Cuv.*

Genus FRYERIA, Gray.

Body depressed, oval. Labial appendages small, distinct, slender. Mantle hard, convex, tubercular. Vent in the middle of the hinder part, in the groove between the mantle and the foot.

Ex. P. pustulosa, *Rüppell*, pl. 68, fig. 5, 5, *a*.

In *Fryeria* the vent occupies a different position to that of *Phyllidia*, not being median and dorsal as in that genus, and the surface of the mantle is tubercular.

Genus HYPOBRANCHIÆA, A. Adams.

Body ovate, depressed. Tentacles clavate, dorsal, ? non-retractile. Mantle broad, extending beyond the foot, the margin thin and flexuous; gills under the mantle-margin at the hind part. Vent posterior, in the groove between the mantle and foot.

Ex. H. fusca, *A. Adams*, pl. 68, fig. 6.

This remarkable animal was discovered by one of the Authors in the shallow pools left by the receding tide on the shore of Koo-Kieng-San, one of the Meiacoshimah Islands, in the Yellow Sea. The upper surface of the mantle was of a sandy colour, the central part of a darker hue, with oblong blotches of a dark brown colour; it was in length about six inches, and in breadth about two and a half. It crawled upon its flattened ventral disk in a slow and languid manner; and when thrown into deeper water floated by undulating the thin edges of the mantle, and gradually sunk to the bottom.

Order NUDIBRANCHIATA.

Gills exposed, or contractile into cavities on the surface of the mantle. Adult animal without any shell. Larva shell-bearing. Foot elongate, formed for walking. Sexes united.

While the numerous tribes of Mollusks furnished with testaceous coverings offer us objects of contemplation remarkable alike for their extreme beauty and the durability of their calcareous envelopes, the scarcely less extensive and certainly far less known families of Naked-gilled Gasteropods exhibit an astonishing variety of form, extreme delicacy of organisation, and great diversity of colour to captivate the eye and occupy the attention of those who wander by the shore or explore the depths of ocean. Clinging to the stems of floating sea-weeds, many, like the Anthobranchs, will be seen extruding their flower-like gills of surpassing elegance, exploring with their foliated tentacles or complex mantle-filaments the plants around them, the brilliant hues of their striped or spotted bodies glancing through the water; some will be observed with bodies so fragile and pellucid that you may see the colour of their blood and count the pulsations of their hearts; some will be seen to have their gills disposed in rows of papillary tubercles on the sides of their bodies, like the Æolids, or tree-like and branching, like the Tritonias; the foreheads of some will be smooth and simple, while those of others will be found adorned with various singular appendages; in others, again, all processes will disappear, all branchial arrangements vanish, and we shall meet with forms almost as simple in their structure as the Nemertoid types among the Annelids.

In their embryonic state these lovely fragile Mollusks are supplied with little, clear, spiral shells, and swim like Pteropods freely through the water, being furnished, at this epoch of their lives, with two head-fins and a large frontal veil. As they grow, however, the shell falls off, and the veil becomes modified, but is usually persistent in the adult. They are universally distributed throughout all seas.

Sub-order ANTHOBRANCHIATA.

Gills plumose, on the hinder part of the mantle, disposed in a circle, or semicircle, round the vent.

Fam. DORIDIDÆ.

Teeth, many in each cross series, sub-similar, inner often smaller. Mantle-edge simple; gills surrounding the vent, on the middle of the hinder part of the back, in a common cavity.

The *Doridida* form an assemblage of most attractive Nudibranchs, which may be easily studied by placing them in glass reservoirs of salt-water, as they are by no means shy, but extend their tentacles and display their branchial plumes to great advantage. In this family the gills are retractile into a common cavity, and the mantle is very large, either entirely, or almost, covering and concealing the foot.

Sub-fam. DORIDINÆ.

Body depressed, rounded above. Mantle convex, large, simple, covering the head and foot.

Genus GLOSSODORIS, Ehrenberg.

Tentacles dorsal. Gills ligulate or strap-shaped, retractile into a common cavity. Back tubercular.

Syn. Doridigitata, *D'Orb.* Pterodoris, *Ehrenb.*

Ex. G. Bertheloti, *D'Orbigny*, pl. 62, fig. 1.

In this genus the back of the mantle is covered with digitate processes, interspersed with small elevated tubercles; the tentacles are clavate, with the clubs laminated; the front side-angle of the foot is produced and lanceolate.

Species of Glossodoris.

Bertheloti, *D'Orb.*
brachyphylla, *Ehrenb.*
D'Orbignyi, *Webb and Berth.*
erythræa, *Ehrenb.*
picturata, *Ehrenb.*
verrucosa, *Cuv.*
xantholeuca, *Ehrenb.*

Genus ACTINODORIS, Ehrenberg.

Tentacles dorsal. Gills strap-shaped, cut or forked at the tip, retractile into a common cavity. Back simple.

Ex. A. flammulata, *Quoy and Gaimard*, pl. 62, fig. 2.

The type of this genus, a large and showy Nudibranch, is very handsomely marked on the back; the mantle-margin is plicate, the tentacles are clavate, lamellar, and retractile within sheaths, and the branchial organ forms a star around the vent, each ray of which is bifid, and each fork of the bifid end is serrated.

Species of Actinodoris.

cruenta, *Quoy and Gaim.*
flammulata, *Quoy and Gaim.*
fumosa, *Quoy and Gaim.*
Krusensternii, *Tilesius.*
maculosa, *Quoy and Gaim.*
Mauritiana, *Quoy and Gaim.*

punctata, *Quoy and Gaim.*
scabra, *Quoy and Gaim.*
sordida, *Quoy and Gaim.*
spiraculata, *Gould.*
sponsa, *Ehrenb.*
superba, *Gould.*
Tilesii, *Tilesius.*
tuberculosa, *Quoy and Gaim.*

Genus ASTERONOTUS, Ehrenberg.

Branchial aperture of the mantle stellate, or partly closed by lobes arranged in a stellate manner.

Ex. A. cruentus, *Alder*, pl. 62, fig. 3.

The back of the mantle in this genus is smooth and without tubercles or appendages; the mantle is wide, and entirely covers the head and foot.

Species of Asteronotus.

cruentus, *Alder.*
Hemprichii, *Ehrenb.*

Genus ACTINOCYCLUS, Ehrenberg.

Gills in the form of a radiate disk, large, lobed, and pinnate; anal aperture not tubular, situated behind the branchial disk, but in the same aperture of the mantle.

Syn. Dendrodoris, *Gray*, not *Ehrenb.*

Ex. A. grandiflora, *Rüppell*, pl. 62, fig. 4.

The principal peculiarity in this genus is the fact of the vent being separate from the branchial aperture, but contained in the same common cavity of the mantle; the gills do not appear to form a complete circle round the vent, but to be interrupted posteriorly.

Species of Actinocyclus.

fragilis, *Ehrenb.*
grandiflora, *Rüpp.*
limbatus, *Cuv.*
setiger, *Rüpp.*
tuberculatus, *Cuv.*
velutinus, *Ehrenb.*
verrucosus, *Ehrenb.*

Genus DORIS, Linnæus.

Tentacles dorsal, sub-clavate, laminated, retractile within a cavity. Gills arborescent, retractile; vent in the centre of the gills.

Syn. Dendrodoris, *Ehrenb.*, not *Gray*. Argus, *Bohadsch*, not *Poli*.

Ex. D. Johnstoni, *Alder and Hancock*, pl. 62, fig. 5.

The branchial plumes in *Doris* form an elaborate coronal around the vent, which, viewed with a common lens in a vessel of water, forms when fully expanded a beautiful object. The surface of the mantle is either smooth or tubercular, and the sheaths of the tentacles are often crenate on their margins.

Species of Doris.

albolineata, *Rüpp.*
Argo, *Blainv.*
aspera, *Alder and Hanc.*
aspersa, *Gould.*
aurea, *Quoy and Gaim.*
aurita, *Gould.*
bilamellata, *Linn.*
candida, *Rüpp.*
cerebralis, *Gould.*
coccinea, *Forbes.*
cuprea, *Ehrenb.*
diaphana, *Alder and Hanc.*
echinata, *Lovén.*
flammea, *Alder and Hanc.*
Flemingii, *Forbes.*
fusca, *Müll.*
granulata, *Ehrenb.*
impudica, *Quoy and Gaim.*
Incii, *Alder.*
Johnstoni, *Alder and Hanc.*
lævis, *Linn.*
lilacina, *Gould.*
limacina, *Quoy and Gaim.*
lugubris, *Ehrenb.*
luteo-rosea, *Rüpp.*
marginata, *Mont.*
millegrana, *Alder and Hanc.*
nigricans, *Rüpp.*
oblonga, *Alder and Hanc.*
obvelata, *Müll.*
Orbignyi, *H. and A. Adams* (*punctata, D'Orb.*).
ornata, *Ehrenb.*
petechialis, *Gould.*
planata, *Alder and Hanc.*
proxima, *Alder and Hanc.*
punctata, *Rüpp.*
puteolana, *Macri.*
Semele, *Blainv.*
smaragdina, *Gould.*
sparsa, *Alder and Hanc.*
sublævis, *Thomp.*

sumptuosa, *Gould.*
tenera, *Costa.*
testudinaria, *Risso.*
tomentosa, *Cuv.*
ulidiana, *Thomp.*
venosa, *Quoy and Gaim.*
vermicelli, *Gould.*
violacea, *Quoy and Gaim.*
Zetlandica, *Alder and Hanc.*

Genus CERATODORIS, Gray.

Tentacles elongate, filiform, not retractile. Mantle covered with elevated processes; gills retractile within a common cavity.

Ex. C. eolida, *Quoy and Gaimard*, pl. 62, fig. 6.

The tentacles in this genus appear to be slender, non-retractile, and serrated on the hinder margin; the branchial plume forms a star-like disk, the rays of which are simply pinnate, and the back of the mantle is covered with slender, subulate, elevated processes.

Sub-fam. GONIODORIDINÆ.

Body angular; mantle distinct, simple, not covering entirely the head and foot.

Genus DORIPRISMATICA, D'Orbigny.

Tentacles dorsal, clavate, laminated, not retractile or invested with sheaths. Gills lanceolate, pinnate.

Syn. Goniodoris, *Forbes.*

Ex. D. Whitei, *Adams and Reeve*, pl. 62, fig. 7.

Except in the position of the tentacles there does not appear to be any great difference between this genus and the *Brachychlanis* of Ehrenberg. The species are usually adorned with the most vivid colours, disposed in red, blue, and yellow lines, bands, and blotches. Found between tide-marks in European and tropical seas.

Species of Doriprismatica.

albescens, *Rüpp.*
atromarginata, *Cuv.*
cærulea, *Rüpp.*
castanea, *Alder and Hanc.*
dorsalis, *Gould.*
elegans, *Quoy and Gaim.*
elegantula, *Phil.*
impudica, *Rüpp.*
infuscata, *Rüpp.*
lemniscata, *Quoy and Gaim.*
lineata, *Eyd. and Soul.*
magnifica, *Quoy and Gaim.*
marmorata, *Savigny.*
nodosa, *Mont.*
obsoleta, *Rüpp.*
pallida, *Rupp.*
picta, *Phil.*
pulchella, *Rüpp.*
pulcherrima, *Cantr.*
purpurea, *Laurillard.*
reticulata, *Quoy and Gaim.*
tinctorum, *Rüpp.*
trilineata, *Adams and Reeve.*
Villafranca, *Risso.*
Webbii, *D'Orb.*
Whitei, *Adams and Reeve.*

Genus BRACHYCHLANIS, Ehrenberg.

Tentacles cervical, not placed on the mantle, but at its edge in front. Mantle narrower than the foot.

Ex. B. pantherina, *Ehrenberg.*

This is a genus of Ehrenberg's, of which he has unfortunately omitted to give a figure: the fact of the mantle being narrower than the foot, and the sub-dorsal position of the tentacles, will serve to distinguish the genus from *Doriprismatica.* A single species, from the Red Sea.

Sub-fam. POLYCERINÆ.

Body elongate, sub-angular; mantle indistinct.

In the remaining six genera of this family the mantle gradually becomes obsolete, the dorsal region is more elevated, and the oral tentacles are but slightly developed. They are animals of great beauty, both of form and colour.

Genus ÆGIRES, Lovén.

Teeth, central none, lateral 17—17. Body covered with very large tubercles. Tentacles linear, simple, retractile within prominent lobed sheaths; forehead papillose. Gills arboriform, placed around the dorsal vent.

Ex. Æ. punctilucens, *D'Orbigny*, pl. 62, fig. 8.

The principal differences between this genus and *Polycera* are the retractile tentacles, and the lobed sheaths at their bases. The branchial plumes are defended by elevated tubercular processes, and the sides are covered with blunt-topped tubercles. The species described are from Norway, France, and the British Islands.

Species of Ægires.

maura, *Forbes.* punctilucens, *D'Orb.*

Genus POLYCERA, Cuvier.

Body smooth or tuberculated. Tentacles clavate, pectinate, non-retractile, without sheaths; a frontal veil with simple processes on the head. Gills with two or more lateral appendages.

Syn. Themisto, *Oken.*

Ex. P. Lessonii, *D'Orbigny*, pl. 62, fig. 9.

This genus has clavate, non-retractile, tentacles, and there are no sheaths at the bases; usually there is an elevated lobed crest on each side of the head, which is continued along the sides of the back as far as the branchial region. The species known are European in their geographical distribution.

Species of Polycera.

citrina, *Alder and Hanc.*
cornuta, *Abildg.*
Lessonii, *D'Orb.*
modesta, *Lovén.*
ocellata, *Alder and Hanc.*
plebeia, *Lovén.*
pudica, *Lovén.*
quadrilineata, *Müll.*
typica, *Thomp.*

Genus THECACERA, Fleming.

Body smooth. Head bilobed, with a simple frontal veil; tentacles clavate, laminated, retractile within wide open sheaths. Gills pinnate, placed round the dorsal vent, surrounded by two or more tubercular lateral appendages.

Ex. T. pennigera, *Montagu*, pl. 63, fig. 1.

The branchiæ in this genus are defended by lateral appendages, the body is smooth, and the head is bilobed. There are three species, which are inhabitants of the British Islands.

Species of Thecacera.

capitata, *Alder and Hanc.*
pennigera, *Mont.*
virescens, *Alder and Hanc.*

Genus PLOCAMOPHORUS, Rüppell.

Body smooth. Tentacles clavate, without sheaths; head-veil with the frontal appendages branched. Gills plumose, surrounding the dorsal vent, without prominent lateral appendages.

Syn. Plocamoceros, *D'Orb.*

Ex. P. ocellatus, *Leuckart*, pl. 63, fig. 2.

The front of the head in this genus is surrounded by beautiful compound processes, and there are no elevated

processes protecting the branchiæ, which are large and plumose. A single species, from the Red Sea.

Genus CERATOSOMA, Adams and Reeve.

Body elongate, smooth. Tentacles clavate, non-retractile, without sheaths; forehead simple, rounded. Gills plumose; back produced behind into a single, elevated, conical, appendage.

Ex. C. cornigerum, *Adams and Reeve*, pl. 63, fig. 3.

In *Ceratosoma* the tentacles are bulbous at their bases, the body is smooth, and the foot is linear and grooved; in our figure the proboscidiform mouth is exserted, which is frequently the case in these animals just before death. These animals, which somewhat resemble *Polyceræ*, are inhabitants of tropical seas, where they are found crawling on the corallines and madrepores.

Species of Ceratosoma.

cornigerum, *Adams and Reeve.* trilobatum, *Gray.*

Genus ACANTHODORIS, Gray.

Tentacles dorsal, retractile within denticulated sheaths. Branchial plumes large, spreading, not retractile.

Ex. A. pilosa, *Müller*, pl. 63, fig. 4.

The clubs of the tentacles are beautifully laminated, and the mantle is covered with long soft processes; the principal feature in this genus, however, is the fact of the branchial plumes being non-retractile. The two species known are from the coasts of Europe.

Species of Acanthodoris.

pilosa, *Müll.* subquadrata, *Alder and Hanc.*

Genus CASELLA, H. and A. Adams.

Body elongated, compressed. Tentacles clavate, sheathed, retractile. Mantle with the margins forming erect, lobate, undulated crests along the sides of the back; gills composed of six lobes, arranged around the anal orifice. Foot linear.

Ex. C. Gouldii, *H. and A. Adams*, pl. 63, fig. 5.

In general aspect this genus resembles *Scyllæa*, but the possession of gills surrounding the vent places it with the *Doridida*; the lateral processes of the mantle resemble *Lomanotus* among the *Æolidida*. The specimen on which this genus is founded was collected by Mr. Gould in Australia, and is dedicated to that eminent Ornithologist.

Genus PELAGELLA, Gray.

Body smooth. Tentacles clavate, non-retractile. Mantle forming a simple, raised edge round the tentacles and branchial region; gills plumose, surrounding the vent.

Ex. P. Paretii, *Verany*, pl. 63, fig. 6.

In *Pelagella* the mantle appears to be reduced to a simple elevated margin, and the branchiæ form a beautiful star with simple pinnate rays; the tentacles are clavate, non-retractile, and pinnate. One species is known, from the Mediterranean.

Fam. ONCHIDORIDIDÆ.

Teeth, two in each cross series. Mantle simple, extending beyond the foot. Gills on the middle of the hinder part of the back, in separate cavities surrounding the vent; vent dorsal.

In this family the gills are each retractile into its proper

cavity, although they are arranged in a circle round the vent on the hinder part of the mantle. The tropical species exhibit considerable activity, and by their splendid colours and varied markings give an air of great vivacity to the groups of corals and banks of sea-weed among which they take up their abode.

Genus ONCHIDORIS, Blainville.

Tentacles dorsal, retractile. Mantle strengthened with spicula. Gills each retractile into its proper cavity.

Syn. Onchidorus, *Férus.* Onchidora, *Cuv.* Onchidiodoris, *Agassiz.*

Ex. O. pusilla, *Alder and Hancock,* pl. 63, fig. 7.

The tentacles for a considerable part of their length are surrounded by elevated rings; the mantle does not always entirely cover the foot, and its surface is nodulose, the nodules being interspersed with numerous calcareous spicula.

Species of Onchidoris.

depressa, *Alder and Hanc.*
inconspicua, *Alder and Hanc.*
Leachii, *Blainv.*
muricata, *Müll.*
pusilla, *Alder and Hanc.*
sanguinea, *D'Orb.*
sparsa, *Alder and Hanc.*

Genus VILLIERSIA, D'Orbigny.

Mantle forming a continuous calcareous shield, pierced with holes for the tentacles, gills, and vent. Gills in the form of two lobes, separate from each other and from the anal orifice.

Ex. V. scutigera, *D'Orbigny,* pl. 63, fig. 8.

In this very singular genus the tentacles are retractile and

clavate, the clubs lamellar; the mantle-margin is finely crenated, and the lobe-like gills are surrounded by an elevated circular disk with an undulated margin. A single species only, from Rochelle, is at present known.

Genus HEXABRANCHUS, Ehrenberg.

Tentacles dorsal, clavate; labial feelers dilated, broad, and crenate. Gills tree-like, in a circle round the anal aperture, each retractile into its proper cavity.

Ex. H. Adamsii, *Gray*, pl. 63, fig. 9.

In the figure we have given to represent this genus the proboscis and labial feelers are protruded, and the former is distended, a circumstance that frequently happens to these animals in a sickly state, and some time previous to their death when kept in captivity. The number of the branchial plumes is usually six, whence Ehrenberg's generic name.

Species of Hexabranchus.

Adamsii, *Gray.*
cardinalis, *Gould.*
laciniatus, *Cuv.*
marginalis, *Quoy and Gaim.*
pretextus, *Ehrenb.*
Sandwichensis, *Quoy and Gaim.*
sanguineus, *Rüpp.*

Genus HEPTABRANCHUS, A. Adams.

Tentacles dorsal, clavate. Gills tree-like, in a broad, lunate series, each gill retractile into its proper cavity.

Ex. H. Burnettii, *A. Adams*, pl. 63, fig. 10.

The splendid species upon which this genus is founded is of large size, about six inches long, and of the most brilliant colours; the vent is tubular, and the mantle does not entirely cover the foot behind; the tentacles are

clavate and retractile, and the clubs lamellar; the labial appendages are dilated and stellate, with crenate lobes; it is a native of the China Sea.

Genus ATAGEMA, Gray.

Tentacles clavate, the apices truncate and adorned with cirrhi. Mantle with an elevated longitudinal crest on the middle of the back. Gills very small, at the end of a dorsal sac.

Ex. A. carinata, *Quoy and Gaimard,* pl. 64, fig. 1.

The mantle in this genus extends considerably beyond the foot posteriorly; the tentacles are retractile within sheaths, and there is an elevated ridge or longitudinal crest along the upper part of the back.

Fam. TRIOPIDÆ.

Teeth, many in each cross series (rarely only four), the inner lateral ones large, irregular-shaped. Mantle small, edged with tentacular appendages; gills on the middle of the hinder part of the back, in a common cavity, surrounding the vent; vent dorsal.

In this family the body is somewhat angular, and the mantle is distinct and furnished with tubercular appendages; the species of the genera comprising this group constitute some of the most delicate and beautiful forms of Nudibranchiate Mollusks.

Genus TRIOPA, Johnston.

Teeth, central none, lateral 8—8. Tentacles clavate, pectinated, retractile within simple sheaths; forehead papillose. Gills, few, pinnate, placed around the vent.

Syn. Tritonia, *Lam.*, not *Cuv.* Psiloceros, *Menke.* Cladophora, *Gray.*

Ex. T. clavigera, *Müller*, pl. 64, fig. 2.

The sheaths of the tentacles in *Triopa* are simple; the forehead is furnished with radiating papillose appendages; and the margin of the mantle is adorned with blunt, curved, cylindrical processes, arranged round the margin. The species are inhabitants of European seas.

Species of Triopa.

clavigera, *Müll.*
lacera, *Müll.*

Genus IDALIA, Leuckart.

Teeth, central 1, lateral 2—2. Tentacles dorsal, linear, laminated, with long, simple, sustentacular appendages, anterior to, and distinct from, them; forehead simple, rounded. Gills plumose, surrounding the vent.

Syn. Okenia, *Leuck.* (olim), not *Zetter.* Euplocamus, *Phil.* Peplidia, *Lowe.*

Ex. I. aspersa, *Alder and Hancock*, pl. 64, fig. 3.

This lovely Nudibranch is peculiarly distinguished by the four elongated, tentacle-shaped appendages anterior to the true tentacles; extending from these, and around the branchial region, are other pointed processes.

Species of Idalia.

aspersa, *Alder and Hanc.*
cirrhigera, *Phil.*
crocea, *Phil.*
dubia, *Sars.*
elegans, *Leuck.*
frondosa, *Phil.*
inæqualis, *Forbes.*
laminosa, *Phil.*
Leachii, *Alder and Hanc.*
Maderæ, *Lowe.*
pulchella, *Alder and Hanc.*
quadricornis, *Mont.*

Genus ANCULA, Lovén.

Body slender, with clavate processes bordering the branchial region of the back. Tentacles clavate, perfoliate, laminated, armed at the base with styliform appendages.

Syn. Miranda, *Alder and Hancock.*

Ex. A. cristata, *Alder and Hancock*, pl. 64, fig. 4.

In this genus a number of elongate, digitate appendages surround the gills; the tentacles are bent backwards and are clavate, with the clubs lamellar; the forehead is simple, and there are curious styliform processes at the base of the tentacles. The only species known is found on the coasts of Britain and Norway.

Sub-order AIOLOBRANCHIATA.

Gills various, not arranged round the vent, but usually in rows along the sides of the body.

Fam. TRITONIIDÆ.

Tongue broad; teeth, many in each cross series; jaws horny. Tentacles retractile within sheaths. Gills superficial, fusiform, or branched, on each side of the back. Vent lateral. Foot linear, channelled.

Many of the genera of this family are pelagic, and are often found crawling on the fronds of floating algæ, or clinging to the narrow stems of gulf-weed, which is frequently met with in large masses at considerable distances from the land; these mimic forests, tenanted by their singular Molluscan inhabitants, thus serve in some measure to enliven the solitudes of the ocean.

Sub-fam. TRITONIINÆ.

Stomach simple.

In this division the stomach appears to be simple, and not ramified or extending into the appendages arranged along the back, as is the case in the next section of the family. The genera inhabit corallines and sea-weed in shallow water, and have been observed to prey upon the zoophytes that live around them.

Genus TRITONIA, Cuvier.

Teeth, central 1, lateral 10—10, or 14—14; mouth armed with horny jaws. Head with a tuberculated or digitated veil; tentacles two, ramose and filamentous, tufted or simple. Gills ramose, arranged in a single series, on a ridge on each side of the back.

Syn. Sphærostoma, *Macgillivray.* Liriope, *Gist.* Candiella, *Gray.*

Ex. T. plebeia, *Johnston*, pl. 64, fig. 5.

The *T. Hombergi* is a very large Nudibranch, often growing to half a foot and even more in length. Sir J. G. Dalyell says that its principal food is the *Lobularia digitata*, and Dr. Johnston records that he took what appeared to be the fry of *Asterias papposa* from the stomach of a *Tritonia.*

Species of Tritonia.

acuminata, *Costa.*
alba, *Alder and Hanc.*
Costæ, *Verany.*
cyanobranchiata, *Rüpp.*
decaphylla, *Cantr.*
glama, *Rüpp.*
Hombergi, *Cuv.*
lineata, *Alder and Hanc.*
plebeia, *Johnst.*
quadrilatera, *Phil.*
rubra, *Rüpp.*
thethydea, *Chiaje.*

Genus TETHYS, Linnæus.

Head with a very large frontal veil, the circumference fringed with cirrhi. Gills in tufts along the sides of the back, alternately unequal.

Syn. Fimbria, *Bohadsch*, not *Mühlf.*

Ex. T. leporina, *Cuvier*, pl. 65, fig. 1.

The very large, semicircular, frontal veil, ciliated at the circumference, gives this genus a remarkable appearance; the tentacular sheaths are very wide; in the fleshy gizzard of a *Tethys*, which is both toothless and without a tongue, Cuvier found fragments of shells, and the legs and other fragments of little crabs.

Sub-fam. MELIBEINÆ.

Stomach branched.

In this division the stomach is curiously extended, and sends ramifications into the branchial appendages of the back, which arrangement led M. Quatrefages to found an order termed by him *Phlebenterica* for this tribe of Nudibranchs.

Genus MELIBE, Rang.

Body elongated, ending in a slender tail. Head with a large, membranous, funnel-shaped veil, with internal radiating cirrhi; tentacles linear, retractile within long trumpet-like sheaths.

Syn. Melibæa, *Forbes.* Melibœa, *Herrmannsen.*

Ex. M. rosea, *Rang*, pl. 64, fig. 6.

The sheaths of the tentacles in this genus are slender and infundibuliform, but the principal feature is the large frontal

veil on the head. M. Rang has observed that the gills spontaneously fall off when touched, and a similar circumstance occurs with regard to those of *Doto* and *Janus*.

Genus DENDRONOTUS, Alder and Hancock.

Teeth, central 1, lateral 10—10. Tentacles clavate, laminated; front of head with branched appendages. Gills ramose, arranged in a single series down each side of the back.

Syn. Amphitrite, *Ascan.*, not *Müller* or *De Haan*. Amphitritidia, *Kröyer*.

Ex. D. arborescens, *Cuvier*, pl. 64, fig. 7.

The sheaths of the tentacles are furnished with branched appendages, and the branchial lobes are arborescent; the foot is narrow and linear, and the animals are found creeping upon corallines in the laminarian and coralline zones.

Genus SCYLLÆA, Linnæus.

Body compressed. Teeth, central 1, lateral 24—24. Tentacles clavate, laminated, retractile within ample sheaths; veil rudimentary. Gills in small ramose tufts on the inner surface of two wing-like lobes on each side of the back. Foot linear, grooved.

Ex. S. fulva, *A. Adams*, pl. 64, fig. 8.

The gizzard in this genus is armed, and the tentacular sheaths are very large, nearly concealing the tentacles; the species are oceanic, living on floating sea-weeds, the stems of which they firmly clasp with their linear, grooved foot.

Species of Scyllæa.

fulva, *A. Adams.*
Ghomfodensis, *Forsk.*
Grayæ, *Adams and Reeve.*
Hookeri, *Gray.*
pelagica, *Linn.*
Quoyi, *Gray.*

Genus NEREA, Lesson.

Body with two ciliated lobes on each side. Tentacles auriform, ciliated. Gills in little tufts on three elevations of the back, and on the sides.

Ex. N. punctata, *Lesson*, pl. 64, fig. 10.

The form of the tentacles in this genus is peculiar, and there appear to be ciliated lobes on the middle of the lower part of the body; a single species only is known, from New Guinea.

Genus LOMANOTUS, Verany.

Tentacles clavate, laminated, with a calyciform sheath; head covered by a veil. Gills crest-like, in the form of two fringed membranes on the sides of the back.

Syn. Eumenis, *Alder and Hancock.*

Ex. L. marmoratus, *Alder and Hancock*, pl. 64, fig. 9.

The tentacles of *Lomanotus* are clavate, and the clubs laminated, the sheaths are close, with simple edges, and the frontal veil is crenate at the margin; the anterior angle of the foot is duplicated and produced. These animals inhabit corallines in the Mediterranean and on the shores of Britain.

Species of Lomanotus.

flavidus, *Alder and Hanc.*
Genei, *Verany.*
marmoratus, *Alder and Hanc.*

Genus BORNELLA, Gray.

Body elongated, convex, sides compressed. Tentacles clavate, laminated; back with three tufts of simple and branched tentacular appendages. Gills plumose at their bases.

Ex. B. Adamsii, *Gray*, pl. 65, fig. 2.

The oral appendages in this tropical genus are stellate, and, besides the digitate branchial appendages, there are little tufts of gills; the foot is linear and grooved, and the animals are pale pink, beautifully striped with vermillion. The species were found on floating weed in the Straits of Sunda and on the Coast of Borneo.

Species of Bornella.

Adamsii, *Gray.* digitata, *Adams and Reeve.*

Fam. PROCTONOTIDÆ.

Tongue broad; teeth, many in each cross series; jaws horny, strong. Tentacles simple, linear, not sheathed. Gills superficial, fusiform, on the sides of the back. Vent dorsal.

The animals comprising this family are provided with horny jaws; their tentacles, moreover, are linear and without sheaths, and the position of the vent is dorsal. They appear to be principally littoral in their habits, feeding on the sea-weed, which occurs in many places in extensive banks along the shore.

Genus PROCTONOTUS, Alder and Hancock.

Head covered with a small semi-lunar veil; tentacles linear, not laminated; labial feelers elongated. Gills ovate, warty, arranged along the sides of the back, and continuous in front above the head.

Syn. Venilia, *Alder and Hanc.* Zephyrina, *Quatref.*

Ex. P. mucroniferus, *Alder and Hancock*, pl. 65, fig. 3.

The animals of this genus have horny jaws, the tentacles are wrinkled and somewhat tubercular, and the branchiæ are tuberculated and arranged in rows; the species inhabit shallow water along the shores.

Species of Proctonotus.

mucroniferus, *Alder and Hanc.*

pilosus, *Quatref.*

Genus JANUS, Verany.

Head covered by a small veil; tentacles perfoliate, arising from a single, large peduncle or crest. Gills cylindrical, simple, crowded, arranged along the sides of the back, and continuous above the head.

Syn. Antiopa, *Alder and Hancock.*

Ex. J. cristatus, *Delle Chiaje*, pl. 65, fig. 4.

The crest between the dorsal tentacles distinguishes this genus from *Proctonotus;* the mouth is furnished with corneous jaws, the tentacles are clavate and lamellated.

Species of Janus.

cristatus, *Delle Chiaje.*

hyalinus, *Alder and Hanc.*

Fam. DOTONIDÆ.

Tongue narrow; teeth in a single central series. Tentacles sheathed at the base, retractile. Gills superficial, fusiform, on the sides of the back.

The armature of the lingual membrane in this family differs from that of the other groups in having a single central series of teeth, and the tentacles are retractile and furnished with sheaths at their bases. There are two genera, which inhabit the laminarian zone.

Genus DOTO, Oken.

Head covered by a simple veil. Tentacles linear, sheaths trumpet-shaped. Gills clavate, compound, or rough with whorls of tubercles, ranged in a single series on each side of the back.

Ex. D. coronata, *Gmelin*, pl. 65, fig. 5.

The tentacular sheaths have simple margins, and the ovate branchiæ are rough with tubercles; the front of the head is simple, and the foot is linear; they appear to feed upon hydroid Zoophytes.

Species of Doto.

coronata, *Gmel.*
fragilis, *Forbes.*
maculata, *Mont.*
pinnatifida, *Mont.*

Genus GELLINA, Gray.

Tentacles linear, retractile, with infundibuliform sheaths; forehead simple. Gills smooth, simple, arranged in a single row on each side of the back.

Ex. G. affinis, *D'Orbigny*, pl. 65, fig. 6.

In this genus the gills, instead of being muricated, are simple and ovate, and number about five on each side; the funnel-shaped sheaths of the tentacles are large, and the tentacles themselves linear and subulate.

Fam. ÆOLIDIDÆ.

Tongue narrow; teeth in a single central series; jaws horny. Tentacles subulate, simple, rarely ringed, contractile. Gills superficial, fusiform or branched, on the sides of the back. Vent lateral.

In the family of Æolids the curious tentacular sheaths, which are present in many of the other tribes of Nudibranchs, appear to be altogether wanting; the orifices of the generative system and vent are situated at the right side, and the gills, usually papillose, are arranged in rows along the sides of the back.

Sub-fam. GLAUCINÆ.

Gills papillose, in groups. Foot rudimentary.

In this section, which comprises but few genera, the foot is undeveloped, and the animals are oceanic in their habits; they are possibly predaceous, and are generally of a blue colour.

Genus GLAUCUS, Forster.

Tentacles four, short and conical. Gills in tufts on tubercles at the sides of the body. Foot rudimentary.

Syn. Pleuropus, *Rafin.*, not *Eschsch.* Laniogerus, *Blainv.* Eucharis, *Peron.*, not *Latr.* Dadone, *Gist.* Nausimacha, *Gist.*

Ex. G. Pacificus, *Eschscholtz*, pl. 65, fig. 7.

The tufts of gills proceeding symmetrically from the sides of the body give this genus a very peculiar appearance; according to the observations of Mr. Bennett, the *Glaucus* feeds greedily on the gelatinous *Porpitæ* and *Velellæ*, floating Acalephs of a blue colour, which probably serve to give a similar colour to these Nudibranchs.

Species of Glaucus.

Atlanticus, *Blainv.*	Forsteri, *Quoy and Gaim.*
draco, *Eschsch.*	Pacificus, *Eschsch.*
Eucharis, *Peron and Lesueur.*	radiatus, *Gray.*

Genus CHIORÆRA, Gould.

Body limaciform. Head very large, semi-globose, pedunculated; mouth encircled with a double series of cirrhi; tentacles cephalic, foliate, retractile. Branchial lobes flabelliform, six, in a single series on each side; generative aperture on the right side. Vent distant, near the back.

Ex. C. leonina, *Gould.*

The most remarkable feature of this genus consists in the long cirrhi surrounding the oral disk, each of which has an independent motion; the foot is folded longitudinally. It is from Port Discovery, Puget Sound.

Genus FILURUS, Dekay.

Tentacles two; mouth terminal, composed of a loose festooned membrane, with two small labial appendages. Gills in two series along the back; caudal appendage long and filiform. Vent terminal.

Ex. F. dubius, *Dekay.*

The abdomen, observes Mr. Dekay, appears to be composed of numerous rings, the body is cylindrical, and the branchial processes are furnished at their tips with five or six spiculæ, which are only seen when the animal is in motion. The loose festooned membrane of the mouth alternately dilates and contracts when the animal is alive. The animal was taken swimming in the sea with its body reversed.

Sub-fam. ÆOLIDINÆ.

Gills in rows on each side. Foot developed.

This section comprises elegant and beautifully-tinted Nudibranchs, which chiefly inhabit the littoral and laminarian zones, in shallow water and between tide-marks; a few have been dredged on corallines from deeper water. According to Messrs. Alder and Hancock, *Flabellina punctata* devours other Nudibranchs, and feeds on its own spawn; *Flabellina coronata* has similar propensities; they feed generally, however, on *Lucernariæ*, and other Zoophytes.

Genus ÆOLIS, Cuvier.

Body broad. Tentacles four, smooth, elongate, subulate; labial feelers elongate. Gills papillose, arranged in longitudinal rows, numerous, depressed, and imbricated.

Syn. Eolidia, *Cuv.* Eubranchus, *Forbes.* Ethalion, *Risso.* Eolidina and Amphorina, *Quatref.* (young).

Ex. Æ. papillosa, *Linnæus,* pl. 65, fig. 8.

In this genus the spawn consists of numerous waved coils. When the tentacles are said to be four, it is to be understood that the labial *palpi* are included, which are here elongate and resemble in form the true tentacles; the tentacles are quite smooth, and the gills continuous and not in clusters.

Species of Æolis.

bellula, *Lovén.*
carnea, *Alder and Hanc.*
Cuvieri, *Blainv.*
diversa, *Couth.*
glauca, *Alder and Hanc.*
glaucoides, *Alder and Hanc.*
Habessinica, *Ehrenb.*
histrix, *Otto.*
limacina, *Phil.*
lineata, *Lovén.*
papillosa, *Linn.*
Peachii, *Alder and Hanc.*
pustulata, *Alder and Hanc.*
salmonacea, *Couth.*
Scacchiana, *Phil.*
paradoxa, *Quatref.*

Genus FLABELLINA, Cuvier.

Tentacles subulate, annulate or perfoliate; labial feelers subulate. Gills clustered, or arranged in separate tufts along the back.

Syn. Phyllodesmium, *Ehrenb.*

Ex. F. coronata, *Forbes,* pl. 66, fig. 1.

The spawn in this group is of many coils. The body is slender, and the buccal appendages or labial tentacles are very long. The chief peculiarity, however, is in the tentacles being annulate, and in the branchial lobes forming clusters continuous over the back.

Species of Flabellina.

affinis, *Cuv.*
annulicornis, *Nat. Cur.*
Bostoniensis, *Couth.*
Cuvieri, *Johnst.*
coronata, *Forbes.*
crassicornis, *Eschsch.*
Drummondi, *Thomp.*
elegans, *Alder and Hanc.*
fastuosa, *Ehrenb.*
gracilis, *Alder and Hanc.*
hyalina, *Ehrenb.*
lineata, *Lovén.*
longicornis, *Mont.*
minima, *Forsk.*
pedata, *Mont.*
pellucida, *Alder and Hanc.*
punctata, *Alder and Hanc.*
subrosacea, *Eschsch.*
smaragdina, *Alder and Hanc.*

Genus MONTAGUA, Fleming.

Body lanceolate. Tentacles and labial feelers subulate. Gills in rather distant transverse rows or rings along the back.

Syn. Cavolina, *Brug.*, not *Gioeni.*

Ex. M. concinna, *Alder and Hancock*, pl. 66, fig. 2.

The spawn is of one or two coils. In some species there is a tendency in the tentacles to become annular; the labial feelers are very long and slender, and the branchiæ are in clusters along the back.

Species of Montagua.

amethystina, *Alder and Hanc.*
amœna, *Alder and Hanc.*
angulata, *Alder and Hanc.*
annulata, *Quoy and Gaim.*
arenicola, *Alder and Hanc.*
aurantiaca, *Alder and Hanc.*
bella, *Rüpp.*
cærulea, *Mont.*
cingulata, *Alder and Hanc.*
concinna, *Alder and Hanc.*
Cuvieri, *Eyd. and Soul.*
Farrani, *Alder and Hanc.*
glottensis, *Alder and Hanc.*
gymnota, *Couth.*
inornata, *Alder and Hanc.*
Lottini, *Lesson.*

nana, *Alder and Hanc.*
natans, *D'Orb.*
olivacea, *Alder and Hanc.*
pallida, *Alder and Hanc.*
picta, *Alder and Hanc.*
pinnata, *Eschsch.*
purpurascens. *Flem.*
rubra, *Cantr.*
stipata, *Alder and Hanc.*
tricolor, *Forbes.*
viridis. *Forbes.*
vittata, *Alder and Hanc.*

Genus FAVORINUS, Gray.

Tentacles long, with a single sub-terminal fold or bulbous ring near their slender tips; labial feelers elongate, linear. Gills in tufts on each side. Front angles of foot greatly produced, subulate.

Syn. Æolis, sp. *Alder and Hancock.*

Ex. F. albus, *Alder and Hancock*, pl. 66, fig. 3.

In this genus the end of the tentacles resembles a cup, with a truncate cylindrical process arising from the bottom; the front angles of the foot are developed and subulate, and the labial palps are very much elongated.

Genus CORYPHELLA, Gray.

Tentacles subulate, smooth; labial feelers or oral tentacles elongate, subulate. Gills in tufts or clusters. Foot sub-angular in front.

Syn. Æolis, sp. *Alder and Hancock.*

Ex. C. Landsburgi, *Alder and Hancock*, pl. 66, fig. 4.

The tentacles in *Coryphella* are simple, and the gills are in clusters along the sides of the body; the oral feelers are greatly produced, and the front of the foot is not angulated.

Species of Coryphella.

Landsburgi, *Alder and Hanc.*
pellucida, *Alder and Hanc.*
rufibranchialis, *Johnst.*

Genus TERGIPES, Cuvier.

Body linear. Tentacles subulate, smooth, simple; labial feelers short. Gills in a single row on each side. Foot square in front.

Ex. T. despectus, *Johnston*, pl. 66, fig. 5.

In this genus the spawn is kidney-shaped. The species inhabit corallines and sea-weed on the verge of the littoral and in the laminarian zone. The gills are large, papillose, and few in number, forming a single series on the sides of the body; the front angles of the foot are not produced, and the oral tentacles are short.

Species of Tergipes.

adspersus, *Nordm.*
bullifer, *Lovén.*
despectus, *Alder and Hanc.*
Edwardsii, *Nordm.*
exiguus, *Alder and Hanc.*
fustifer, *Lovén.*
Lamarckii, *Desh.*

Genus PHIDIANA, Gray.

Tentacles clavate, perfoliate; labial feelers subulate. Gills in cross rows along the back.

Syn. Cavolina, *D'Orb.*, not *Brug.* or *Gioeni.*

Ex. P. Patagonica, *D'Orbigny*, pl. 66, fig. 6.

In *Phidiana* the form of the dorsal tentacles is clavate,

and the clubs are laminated; the oral tentacles or feelers are very long, and the branchiæ are linear, and crowded in cross series along the sides of the back; the caudal extremity is slender and greatly extended.

Species of Phidiana.

Inca, *D'Orb.*
longicauda, *Quoy and Gaim.*
Northumbrica, *Alder and Hanc.*
Patagonica, *D'Orb.*

Genus CALLIOPÆA, D'Orbigny.

Head without tentacles; labial feelers very long and tapering. Gills pyriform, placed in longitudinal lines. Front of foot angular.

Ex. C. bellula, *D'Orbigny*, pl. 66, fig. 7.

The obvious and striking peculiarity in this beautiful Nudibranch is the entire absence of the dorsal tentacles, in which it resembles *Alderia*, but the vent does not appear to be dorsally situated; the eyes are conspicuous on the back of the head.

Genus FIONA, Alder and Hancock.

Tentacles four, sub-dorsal, without sheaths; mouth with corneous jaws. Gills papillary, on sub-pallial expansions on the sides of the back, meeting posteriorly; papillæ with a membranous fringe on the inner sides.

Syn. Oithona, *Alder and Hanc.*, not *Baird.*

Ex. F. nobilis, *Alder and Hancock*, pl. 67, fig. 1.

The principal peculiarity in this genus is the fact of the branchial lobes each having a membranous fringe with a

crenate margin on their inner sides; the anterior or oral tentacles, moreover, are situated considerably behind the lips, and the orifices of the reproductive system are separate, and situated below the tentacles on the right side.

Fam. HERMÆIDÆ.

Body elongated, not provided with a distinct mantle. Mouth unarmed, or with corneous jaws; tentacles sometimes wanting; when present two, dorsal, non-retractile. Gills papillose. Vent usually central, on the posterior half of the back; genital orifice at the right side.

The dorsal position of the vent, and the indistinct mantle distinguish this family from *Æolididæ*, and the presence of papillose gills from *Elysiidæ;* perhaps those genera with horny jaws belong to a distinct family.

Genus HERMÆA, Lovén.

Tentacles two, longitudinally folded; head without lobes. Gills elongate, papillose, smooth, arranged along the sides of the back.

Ex. H. dendritica, *Alder and Hancock*, pl. 67, fig. 2.

The sides of the gills are simple, and the tentacles are folded on themselves. The species inhabit the littoral and laminarian zones, and are sometimes found gregarious on *Codium tomentosum*.

Species of Hermæa.

bifida, *Mont.*
dendritica, *Alder and Hanc.*
venosa, *Lovén.*

Genus ALDERIA, Allman.

Head without tentacles, produced into a lobe on each side. Gills papillose, arranged in transverse rows on the sides of the back.

Syn. Stiliger, *Lovén*, not *Ehrenb.*

Ex. A. modesta, *Lovén*, pl. 67, fig. 3.

This curious Nudibranch was taken by Dr. Allman in great numbers in salt marshes, near Skibbereen, in the county of Cork; the head is without tentacles, and there are no jaws.

Genus STILIGER, Ehrenberg.

Tentacles two, subulate, simple, contractile. Gills styliform, simple, arranged in rows along the sides of the body.

Ex. S. ornatus, *Ehrenberg*, pl. 67, fig. 4.

The tentacles in this genus are non-retractile, simple, and elongate, and the papillary branchiæ are crowded and disposed along the sides of the back.

Genus CLŒLIA, Lovén.

Tentacles two, simple, undefended, contractile, sub-lateral; a large labial veil, produced on each side into an oblong, flat lobe. Gills simple, papillose, lateral, in a simple series on each side of the back. Foot rather broad.

Syn. Pterochilus, *Alder and Hanc.*, not *Klug.* or *Hook.* Embletonia, *Alder and Hanc.*

Ex. C. pulchra, *Alder and Hancock*, pl. 67, fig. 5.

The animals of this genus inhabit the sea-weeds in the laminarian zone; the head is furnished on each side with a

flattened lobe, and the gills are arranged in single file on each side of the body.

Species of Clælia.

fimbriata, *Vahl.*
formosa, *Lovén.*
minuta, *Forbes and Goodsir.*
pallida, *Alder and Hanc.*
pulchra, *Alder and Hanc.*
trilineata, *Sars.*

Fam. ELYSIIDÆ.

Body limaciform, clothed with cilia. Tongue narrow; teeth in a single, central series. Tentacles subulate or linear, folded; eyes sessile, near the bases of the tentacles. Gills in the form of plaits or vessels radiating on the surface of the back. Vent central, dorsal, on the hinder part of the back.

In this family the respiratory function appears to be performed by the entire surface of the body, special organs for that purpose being almost obsolete. It constitutes a portion of the Order *Pellibranchiata* of Alder and Hancock.

Genus ELYSIA, Risso.

Body with the lateral ridges dilated into wing-like natatory appendages. Head distinct, with two conspicuous auriform tentacles.

Syn. Actæon, *Oken*, not *Montf.* Aplysiapterus, *Chiaje.* Rhycobranchus, *Cantraine.*

Ex. E. viridis, *Montagu*, pl. 67, fig. 6.

The auriform tentacles and extended natatory appendages distinguish this genus, which inhabits the laminarian zone, usually on *Codium tomentosum* and *Zostera marina.*

Species of Elysia.

australis, *Quoy and Gaim.*
elegans, *Milne Edw.*
fusca, *Phil.*
lobata, *Gould.*
timida, *Risso.*
viridis, *Mont.*

Genus PLACOBRANCHUS, Van Hasselt.

Body with two, large, semicircular, membranous expansions, crossing on the back and forming a canal open at both ends. Tentacles club-shaped, lobed at the end.

Ex. P. ocellatus, *Quoy and Gaimard*, pl. 67, fig. 7.

In M. Rang's figure of this genus the lateral expansions appear to be extended, and the tentacles are short and conical; most probably, when at rest, the animal folds them over the back, and thus forms the tubular canal described by Van Hasselt.

Species of Placobranchus.

ianthobaptus, *Gould.*
ocellatus, *Quoy and Gaim.*

Fam. LIMAPONTIIDÆ.

Body depressed. Tongue narrow; teeth in a single, central series. Tentacles none, or simple, contractile. Gills none external.

In this group of slug-like forms the branchial appendages are altogether absent, or represented only by simple lobes or ridges on the sides of the body; the tentacles are linear, and not longitudinally folded as in *Elysiidæ*, and the body is depressed. In the genus *Rhodope* of Kölliker the Mol-

luscan type appears to be at the lowest stage of development, and to represent the *Planariæ* among the Annelids.

Genus LIMAPONTIA, Johnston.

Body depressed, without lateral ridges. Head elevated at the sides into two crest-like ridges; eyes large, sessile on the back of the head, in the centre of pale circular spaces. Mantle distinct.

Syn. Pontolimax, *Creplin.* Chalidis, *Quatref.* Niobe, *Girard.*

Ex. L. limacina, *O. Fabricius*, pl. 67, fig. 8.

The sides of the body rather overhang the foot; the eyes are large, at the posterior extremity of the crests, within a pale space; the animals are gregarious, feeding on confervæ in small pools above half-tide.

Species of Limapontia.

cærulea, *Quatref.* limacina, *O. Fabr.*

Genus ACTEONIA, Quatrefages.

Body with a slightly-elevated ridge on each side. Head carinated at the sides, each carina produced above into a short, flat, ear-like, tentacular process, behind which are the eyes.

Ex. A. corrugata, *Alder and Hancock*, pl. 67, fig. 9.

The surface of the body is covered with regular wrinkles like an *Arion*, the foot is linear, and the eyes are in pale spaces at the posterior extremities of the ridges; the species inhabit pools above half-tide.

Species of Acteonia.

corrugata, *Alder and Hanc.* sinistra, *Quatref.*

Genus CENIA, Alder and Hancock.

Body with a slight ridge on each side; back elevated. Head sub-angulated, with two linear, dorsal tentacles, behind and exterior to which are the eyes.

Syn. Ictis, *Alder and Hancock*, not *Kaup.*

Ex. C. Cocksii, *Alder and Hancock*, pl. 68, fig. 1.

The animals of this genus inhabit pools between tide-marks; the tentacles are obtuse and cylindrical.

Genus FUCICOLA, Quoy and Gaimard.

Body limaciform, simple, without lateral lobes or semi-circular expansions. Tentacles two, simple, club-shaped.

Syn. Dermatobranchus, *Van Hass.* Abranchus, *Van Hass.* Fucola, *Quoy and Gaim.* (error typ.).

Ex. F. rufa, *Quoy and Gaimard*, pl. 68, fig. 2.

This genus, remarkable for its simplicity of organization, is pelagic in its habits, living on floating sea-weed.

Genus RHODOPE, Kölliker.

Body creeping, vermiform, convex above, flat beneath, without mantle, without shell, without gills, without tentacles or any appendages.

Ex. R. Veranii, *Kölliker.*

This curious genus, characterised principally by its negative peculiarities, was observed by its author on algæ, at

Messina, and would seem to be one of the most simply organized among the Mollusca; unfortunately there is no figure given.

Sub-class HETEROPODA.

Body formed for floating, the anterior portion usually greatly developed, the abdomen rudimentary, and exposed, or spiral, and protected by a shell. Tongue armed with recurved hooks. Head proboscidiform, usually provided with eyes and tentacles. Heart prosobranchiate. Gills tufted, situated in advance of the heart. Foot laterally compressed and fin-like, or flat, and furnished with a vesicular appendage or float.

Shell spiral, sub-spiral, or altogether wanting.

Animal pelagian, predatory, bisexual, with reciprocal impregnation. Larva shell-bearing, with ciliated head-lobes.

In the Branchiferous Gasteropods which we have already considered, and also in the Pulmoniferous tribes of Mollusca, the fleshy part of the foot is dilated and flattened, and the visceral mass is situated above it; but in the Heteropods, which inhabit the high seas, and which are organized for swimming, the locomotive organ, or foot, is laterally compressed into the form of a vertical and rounded fin, or it is rudimentary and provided with a vesicular appendage, or float, to enable the animal to sustain itself near the surface of the water. Not being formed for crawling on the earth, or creeping on the bed of the sea, these animals, moreover, have the front portion of the body sometimes enormously developed, so as to qualify them better for their pelagian life. In *Ianthinidæ* and *Atlantidæ*, where the shell is well developed, the animals are retractile within

their testaceous coverings; but in *Pterotracheidæ*, in which the body is very large, the shells are rudimentary, or even entirely absent. M. Blainville considered the Heteropods (which he styled *Nucleobranchiata*) as a single family of the Nudibranchiate Order; M. Cuvier regarded them as constituting a particular Order of Gasteropods; and Milne Edwards believes that they form an abnormal group, or second section of Swimming Gasteropods, of the same value as the Ordinary Gasteropods, which are characterised by a large, fleshy, flattened foot, formed for crawling on the earth. Unwilling, however, to separate the Branchiferous tribes, which undergo a metamorphosis and live in the water, from the Pulmoniferous Mollusks, whose young are like the parent and which respire free air, we have preferred to view the Heteropods as an independent Sub-Class between these two great divisions.

Fam. IANTHINIDÆ.

Tongue, with the rachis unarmed; the lateral teeth numerous, uniform, simple, slender. Head proboscidiform; tentacles short and obtuse, with pointed eye-pedicels at their bases, but without any trace of eyes. Gills plumose, partially exserted. Foot small, flat, rudimentary, furnished with a vesicular appendage on the hinder part. ? Sexes separate.

Shell thin, translucent, spiral, more or less turbinate, with a sinistral nucleus.

Pelagian.

The armature of the lingual membrane in these oceanic animals somewhat resembles that of *Scalidæ*, which also have a similar power of secreting a purple fluid; the lingual

dentition is also very similar to that of *Bullidæ;* and the presence of eye-pedicels at the outer bases of the tentacles, reminds one of the *Trochidæ.* The greatest affinity, however, is, perhaps, with the *Atlantidæ* and *Carinariæ*, which also disport themselves on the wide bosom of the ocean. These "Violet-snails," as they are sometimes called, are blind, but as they appear to select the night for their predatory operations on the high seas, this deprivation can be of little moment to them.

Genus IANTHINA, Bolten.

Shell sub-globose, violet, spiral, thin, translucent; spire short, whorls slightly angulated, nucleus sinistral, minute; aperture large, quadrangular; inner lip reflexed; columella tortuous; outer lip thin, notched or sinuated in the middle.

Syn. Iodes, *Leach.* Ametistina, *Schinz.* Achates, *Gist.*

Ex. I. violacea, *Bolten,* pl. 69, fig. 1. Shell, I. violacea, fig. 1, *a.*

The swimming-raft, or float of cartilaginous air-sacs, which serves to keep these animals at the surface, is regarded as an extreme modification of an operculum by many Naturalists. The ovarian capsules are fixed to the under surface of the float in order to prevent their sinking beneath the influence of the solar rays. When molested, these animals exude a violet-coloured fluid, which is said to be derived from the *Velellæ* and other pelagian Acalephs, which constitute their favourite food.

Species of Ianthina.

communis, *Lam.*
exigua, *Lam.*
globosa, *Swains.*
incisa, *Phil.*
pallida, *Harvey.*
planospirata, *Adams and Reeve.*
striolata, *Adams and Reeve.*
turrita, *V. d. Busch.*
violacea, *Bolt.*

Genus RECLUZIA, Petit.

Shell translucent, thin, fragile, ovate or oblong, white, covered with a brownish epidermis; spire elevated, whorls ventricose, the last longer than the spire; aperture ovate, wider anteriorly; inner lip oblique, sinuous in the middle; outer lip acute, entire.

Ex. R. Rollandiana, *Petit*, pl. 69, fig. 2.

M. Jehenne, Captain in the French Navy, who discovered this genus, has observed that the animals are pelagian, and similar in their habits to the *Ianthinæ*, like which they also bear a vesicular appendage on the foot. The shells may be distinguished from those of *Ianthina* by their form being more elongated, by their more elevated spire, and oblique columella, and by the outer lip being straight and not notched; the lines of growth, moreover, are straight, and the colour is dirty white under a brownish epidermis.

Species of Recluzia.

Jehennei, *Petit.*
Rollandiana, *Petit.*

Fam. MACGILLIVRAYIIDÆ.

Lingual dentition closely resembling that of *Rissoëlla*. Head with four, nearly equal, obtuse tentacles; eyes —— ? Mantle inclosed, extended in front into a long, exserted siphon. Foot large, expanded, truncate anteriorly, produced behind, and ? furnished with a float as in *Ianthina*.

Operculum horny, annular, with a sub-central nucleus, and strengthened by a straight rib.

Shell horny, sub-transparent, globose, spiral.

The animals constituting this group are not well known. The explanation of the four apparent tentacles may perhaps be found in supposing the two outer to be elongated eye-pedicels, or by another supposition, that the two inner are elongate lobes of a divided rostrum. The statement of the Naturalist of H. M. S. Rattlesnake, to whom the typical genus is dedicated, that the animal is possessed of a float, and the structure and form of the shell, which bears some analogy to *Recluzia* and *Ianthina*, together with the pelagian, gregarious habits of the animal, induce us to place these creatures among the Heteropods.

Genus MACGILLIVRAYIA, Forbes.

Operculum thin, horny, semicircular, with concentric elements; nucleus near the outer edge, with a straight rib continued nearly to the margin, and indicated externally by a groove.

Shell spiral, dextral, imperforate, thin, horny, globular, transparent; spire obtuse; aperture oblong, entire, angular

in front; columella rather straight; outer lip acute, the margin entire.

Ex. M. pelagica, *Forbes*, pl. 69, fig. 3. Operculum, M. pelagica, fig. 3, *a*, 3 *b*. Shell, M. spinigera, *A. Adams*, fig. 3, *c*.

The species on which this genus is founded was taken in the towing-net by Mr. Macgillivray off the East coast of Australia, fifteen miles from the shore. They were observed to be associated together in considerable numbers. The *M. spinigera* was also captured by one of the Authors, floating gregariously in the middle of the Mindoro Sea. The *Struthiolaria microscopica* of Gray, described in Beechy's "Voyage," is, perhaps, the same shell as *M. pelagica*, Forbes.

Species of Macgillivrayia.

pelagica, *Forbes.*
spinigera, *A. Adams.*
straminea, *A. Adams.*

Genus CALCARELLA, Souleyet.

Shell sub-globose, horny, pellucid; whorls three, flat above, bicarinate, apex mamillated, last whorl strongly tri-carinate, keels wide apart, armed with regular, acute, triangular spines; aperture triangular, internally semilunar and thickened; inner lip thickened, convex in the middle, sinuous anteriorly; outer lip tri-spinose.

Ex. C. spinosa, *Souleyet*, pl. 69, fig. 4, 4, *a*.

The little shells on which this genus is founded are pelagian, having been discovered by M. Souleyet in the South Sea, during the voyage of the Bonite. A similar form was detected by one of the Authors, associated with specimens of *Macgillivrayia spinigera*, floating on the surface of the

sea of Mindoro, but, unfortunately, was considered the fry of some other Mollusk, and the animal was not examined. In general appearance, *Calcarella* is very similar to *Trichotropis bicarinata*, which is, however, said to be an inhabitant of deep water.

Fam. ATLANTIDÆ.

Body spiral, inclosed in a shell. Tongue with a single, tri-cuspid, rachidian tooth, and three hooked laterals on each side. Head proboscidiform, large and cylindrical; tentacles tapering; eyes large and sessile on the sides of the head behind the tentacles. Gills pectinate, situated in a dorsal mantle-cavity. Foot divided, the fore part vertically compressed and dilated, forming a ventral fin, with a small sucker on the front edge, the hind part horizontally flattened, small, pointed, and operculigerous.

Operculum vitreous, ovate or triangular.

Shell glassy, transparent, thin, spiral, symmetrical, discoidal, carinated.

Pelagian.

The *Atlantidæ* appear to be generally distributed throughout the seas of warm latitudes, coming to the surface in calm weather, especially after nightfall, and disporting themselves in vast numbers. They have been observed by one of the Authors swimming, shell downwards, with sudden jerks, by means of their compressed and fin-like foot, and anchoring themselves, when fatigued, to the sides of the vessel in which they were held captive, by the small sucker at the fore part of the ventral fin; they are especially numerous in the South-Atlantic and Pacific Oceans. The gills in these animals are pectinated, and situated, like those of the

Ianthinidæ, at the bottom of the respiratory cavity of the mantle; the orifice of the reproductive organs is at the right side in front of the vent. As M. Mörch has pointed out, the general form of the animal and structure of the foot is very similar to that of *Onustidæ*, which, however, inhabit the bed of the sea, and never approach the surface like the Heteropods. The lingual dentition is similar to that of the *Pterotracheidæ*.

Genus ATLANTA, Lesueur.

Operculum ovate, sub-spiral, lamellar, nucleus apical, dextrally spiral.

Shell spiral, compressed, glassy, transparent, conspicuously keeled; spire flattened, nucleus dextrally spiral, smooth; aperture oval, narrow, fissured in front at the keel.

Syn. Steira, *Eschscholtz.*

Ex. A. Peronii, *Lesueur and Blainville*, pl. 69, fig. 5. Operculum, A. Peronii, fig. 5, *a*. Shell, A. Peronii, fig. 5, *b*.

The Atalants, which were first discovered by Lamanon, one of the Naturalists attached to the Expedition of La Perouse, are beautiful and sprightly little creatures, when observed in their native element, swimming rapidly about, and examining every object within their reach with their long, muzzle-shaped heads. The shells are transparent and glassy, and may be considered the existing analogues of the fossil *Bellerophon* and *Porcellia;* about fifteen species have already been described.

Species of Atlanta.

brunnea, *Eyd.*
cunicula, *Gould.*
depressa, *Eyd.*
Gaudichaudi, *Eyd.*
heliconoidea, *Eyd.*
inclinata, *Eyd.*

inflata, *Eyd.*
involuta, *Eyd.*
Lamanoni, *Eyd.*
Lesueurii, *Eyd.*
Peronii, *Lesueur and Blainv.*
primitia, *Gould.*
Quoyi, *Eyd.*
rosea, *Eyd.*
turricula, *D'Orb.*

Genus OXYGYRUS, Benson.

Operculum sub-triangular, vitreous, lamellar.

Shell spiral, cartilaginous, umbilicated on both sides, back rounded, only keeled near the aperture; nucleus involute, sulcated, calcareous; aperture oval, not fissured anteriorly.

Syn. Ladas, *Cantraine.* Helicophlegma, *D'Orb.* Brownia, *D'Orb.*

Ex. O. Keraudrenii, *Rang*, pl. 69, fig. 6. Operculum, O. Keraudrenii, fig. 6, *a*. Shell, O. Keraudrenii, fig. 6, *b*.

The shell in this genus, with the exception of the chalky nucleus, is nearly membranous; in the recent state it is quite transparent, but when dry, it becomes milky, opaque, and corrugated.

Species of Oxygyrus.

Keraudrenii, *Rang.*
Rangii, *Eyd.*
tessellata, *Gould.*
violacea, *Gould.*

Fam. PTEROTRACHEIDÆ.

Tongue short, oblong or triangular; teeth in three series; the central transverse, with three recurved cusps; the laterals three on each side, the inner transverse, with a hooked apex, the two outer sickle-shaped. Head elongate, proboscidiform; mouth with two vertical, semicircular lips;

tentacles subulate; eyes large, and sessile on the sides of the head. Body large, sub-cylindrical, hyaline, gelatinous, ending behind in a long tail; abdomen rudimentary, forming a sessile, exposed nucleus as in *Pterotrachea*, or a pedunculated nucleus, covered with a thin pellucid shell, as in *Carinaria*; gills tufted, situated in front of the nucleus. Foot compressed and fin-like, with a small flat disk on the hinder edge.

Operculum none.

Shell symmetrical, hyaline, sub-spiral.

Pelagian.

The animals of this family are all pelagian, and are common in tropical seas, swimming in a reversed position with considerable velocity. Like the Atalants and the Pteropods, they usually come to the surface towards the close of day. They are predacious, feeding on the small *Acalephæ* that abound in the solitudes of the ocean. Owing to the peculiarities of their organization they are unable to crawl, but they can attach themselves to floating bodies by means of the sucker on their ventral fin. *Carinaria* and *Cardiopoda* are the only genera at present known which are provided with shells. It frequently happens that individuals are torn and mutilated by fishes, in which case the specimens so mutilated have formed the types of spurious genera. Of such a nature are the *Monophorus* and *Timoriensis* of Quoy and Gaimard, and the *Anops* of D'Orbigny. The gills are well developed in *Carinaria*, but in *Firoloidea* they are obsolete or rudimentary; the eyes are hour-glass-shaped and well-organized, and are even furnished in some cases with a rudimentary eyelid, and there are distinct auditory vesicles, each containing a round otolite. The oviduct, in some genera, is extruded in

the form of a long, slender, moniliform tube, and in others is furnished with a singular leaf-like appendage. The true homologies of the foot and caudal fin in the *Pterotracheidæ* have been pointed out by Huxley; the locomotive disk, or mesopodium, of ordinary Gasteropods being represented by the sucker, the anterior lobe, or propodium, by the ventral fin, and the operculigerous lobe, or metapodium, by the pointed tail.

Genus PTEROTRACHEA, Forskäl.

Tentacles none; head armed in front with conical processes; eyes large and conspicuous. Body fusiform, ending behind in a prolonged, keeled, conical tail, which is sometimes pinnate; nucleus prominent; gills distinct. Ventral fin, or foot, furnished with a sucker.

Shell none.

Syn. Firola, *Peron and Lesueur.* Hypterus, *Rafin.*

Ex. P. hippocampus, *Philippi*, pl. 69, fig. 7.

The species of *Pterotrachea* are probably very numerous, although not yet made known; they are found in the seas of temperate and tropical climates, and are often marked with coloured spots. The genus was well figured and described by Forskäl, who established it.

Species of Pterotrachea.

Blainvilleana, *Lesueur.*
coronata, *Forsk.*
Desmarestina, *Lesueur.*
Edwardsii, *Desh.*
Frederica, *Lesueur.*
hippocampus, *Phil.*
hyalina, *Chiaje.*
Keraudrenii, *Eyd.*
Lesueurii, *Risso.*
mutica, *Lesueur.*
pulmonata, *Forsk.*
Quoyana, *D'Orb.*
rufa, *Quoy.*

Genus FIROLOIDEA, Lesueur.

Tentacles distinct, subulate; eyes large. Body cylindrical, ending behind in a short tail usually divided into a rounded upper, and a pointed lower, lobe; nucleus small, situated towards the hinder part of the body; gills indistinct or rudimentary. Ventral fin without a sucker.

Shell none.

Syn. Cerophora, *D'Orbigny.*

Ex. F. Lesueurii, *D'Orbigny*, pl. 69, fig. 8.

In this genus the nucleus is placed far behind, the tentacles are developed, and there is no sucker on the ventral fin; the caudal appendage, moreover, is usually short, and furnished with fin-like lobes. The species inhabit the Atlantic Ocean.

Species of Firoloidea.

aculeata, *Lesueur.*
Eydouxii, *Gray.*
Gaimardii, *D'Orb.*
Lesueurii, *D'Orb.*

Genus CARINARIA, Lamarck.

Tentacles distinct, slender, elongated; eyes large, on the sides of the head. Body smooth or granulated, gelatinous, semi-pellucid, large and fusiform, ending behind in a laterally compressed, pointed tail or caudal fin; nucleus pedunculated; gills pinnate, exserted, and protected by a shell. Ventral fin semicircular or subtrigonal, and furnished with a distinct marginal sucker.

Shell thin, hyaline, glassy, symmetrical, conical, compressed, with a recurved apex, a minute dextrally-spiral

nucleus, and a fimbriated dorsal keel; aperture large, ovate, entire.

Ex. C. Atlantica, *Adams and Reeve*, pl. 70, fig. 1. Shell, C. cristata, *Linnæus*, fig. 1, *a*.

These animals progress very much in the same manner as the *Pterotracheæ* and *Firoloideæ*, darting through the water with great rapidity in a reversed position, their body straightened and their caudal fin undulating from side to side. They appear also to prefer the twilight for the season of their predatory excursions, when they may be taken at the surface, in the trawl, in considerable numbers. They are found in the Atlantic and Pacific Oceans, and in the Mediterranean, and, like the other Heteropods, are supposed to feed on *Acalephæ* and other small pelagian animals.

Species of Carinaria.

Atlantica, *Adams and Reeve.*
australis, *Quoy and Gaim.*
cristata, *Linn.*
depressa, *Rang.*
Gaudichaudi, *Eyd.*
gracilis, *Reeve.*
punctata, *D'Orb.*

Genus CARDIAPODA, D'Orbigny.

Tentacles slender, elongate; eyes distinct, on the sides of the head. Body fusiform, ending in a long, simple, acuminate tail; nucleus pedunculated; gills pinnate. Ventral fin sub-circular, provided with a sucker.

Shell minute, cartilaginous, regularly involute; peristome expanded and bi-lobed in front, enveloping the spire behind.

Syn. Carinoidea, *Eydoux and Souleyet.*

Ex. C. placenta, *Eydoux and Souleyet*, pl. 70, fig. 2. Shell, C. placenta, fig. 2, *a*, 2, *b*.

These animals are very closely allied to *Carinaria*, and are found in the Atlantic; the small, fragile, helicoid shell which protects the nucleus is very rare, and doubtless often escapes observation on account of its minute size. The tail in this genus is simple and acuminate, the tentacles are distinct and elongate, and the eyes large, and apparently well developed.

Species of Cardiapoda.

carinata, *D'Orb.*
caudina, *Rang.*
pedunculata, *D'Orb.*
placenta, *Eyd. and Soul.*

Fam. PHYLLIRRHOIDÆ.

Lingual membrane narrow; teeth in a single, central series; mouth provided with horny jaws; tentacles elongate, filiform. Body fusiform, translucent, vertically compressed, ending behind in a fin-like tail; gills none external. Foot or ventral fin none. Vent at the right anterior side of the body; orifices of the organs of generation on the same side, in front of the vent. Sexes united.

Pelagian.

The singular oceanic creatures comprised in this family appear rather to resemble the Heteropods in their general form, structure, and mode of life than the Nudibranchs. They are found swimming at the surface in mid-ocean towards twilight; their progression, slow and steady, is effected by lateral inflections of the body and caudal fin, the elongate, flattened tentacles being extended in a straight line in front of the head. They have an upper and lower semi-lunar, cutting, horny jaw, and their stomach is furnished with elongated cæca.

Genus PHYLLIRRHOE, Peron and Lesueur.

Head with a short rounded muzzle and horny jaws; tentacles long and filamentary; eyes none. Body translucent, fusiform, laterally compressed, ending posteriorly in a vertical, flattened, truncate, or bi-lobed caudal fin.

Syn. Eurydice, *Eschscholtz.*

Ex. P. punctulatum, *Quoy and Gaimard*, pl. 70, fig. 3.

No indication of external gills has been detected in these animals, which in all probability respire by the skin like some species of *Firoloideæ*, where the branchiæ are only indicated by a ciliated sub-spiral band.

Species of Phyllirrhoë.

Amboinensis, *Quoy and Gaim.*
bucephala, *Peron and Lesueur.*
Lichtensteinii, *Eschsch.*
punctulatum, *Quoy and Gaim.*
roseum, *D'Orb.*
rubrum, *Quoy and Gaim.*

Genus ACURA, H. and A. Adams.

Head with a rounded, obtuse muzzle; tentacles long, flattened, and filamentary; eyes none; mouth with two transverse, lunate, horny mandibles. Body laterally compressed, ending behind in a long, slender, simple, pointed caudal appendage.

Ex. A. pelagica, *A. Adams*, pl. 70, fig. 4.

The animals on which this genus is founded chiefly differ from *Phyllirrhoë* in the simple and elongate caudal fin. Specimens were procured in the middle of the South Atlantic in which the upper and lower margins of the

body were membranous and formed a sort of fin extending the entire length of the body; the skin was covered with fine, depressed, parallel lines, with a regular row of small round puncta in each interval; the general colour was pale brown, the tentacles being of a darker brown, and the proboscis-like head was of a delicate pink.

Fam. PTEROSOMATIDÆ.

Lingual dentition —— ? Head without a proboscis; mouth small, situated at the anterior extremity of the body; tentacles none; eyes sessile on the upper surface of the head. Body long and tapering, with two large, lateral, horizontal, wing-like appendages, and extending behind in a long, tapering tail. Gills —— ? Foot none.

Shell none.

Pelagian.

The animal on which this family is established is naked, gelatinous, and transparent, thickest in the middle, with a very large, horizontal, lateral fin which commences at the tail, and extends round the sides so as to form with the body a shield, convex above, concave beneath; the front margin is the thickest and somewhat truncate, the hind margin the smallest and thinnest; the tail is cylindrical and of a moderate thickness; the mouth, situated at the anterior end of the body, is small and without a proboscis; the eyes are elongated, sessile, and close together on the upper part of the head; the alimentary canal is red and visible through the body, and is spirally contorted at the thickest part; the gills, anus, and organs of generation are unknown. (Lesson.)

Genus PTEROSOMA, Lesson.

Tentacles none; eyes sessile on the head. Body gelatinous, transparent, sub-cylindrical, with a large, thin, horizontal, wing-like lobe on each side.

Shell none.

Ex. P. plana, *Lesson*, pl. 70, fig. 5.

M. Lesson discovered this curious genus, of which but a single species is known, in the sea between the Moluccas and New Guinea, where it was met with in great abundance; he observes that it uses the membranous expansion with which its body is surrounded for progression, and swims horizontally with great velocity.

Sub-class PULMONIFERA.

Breathing organ in the form of an air-sac, or dorsal cavity, lined by a vascular network. Heart situated before the lung; Abdomen rudimentary, or spiral and well-developed, usually protected by a shell. Sexes separate, or united in the same individual. Adult and larva shell-bearing, larva shaped like the parent, not furnished with cephalic fins.

Terrestrial or aquatic, respiring free air.

The *Pulmonifera* differ from the families of Gill-bearing Gasteropods in not undergoing a metamorphosis, the young animal being shaped like the parent and not furnished with deciduous cephalic fins. Their breathing organ, moreover, is in the form of a sac, instead of being arranged in tufts or folds, and they respire free air. In the Operculated division the sexes are distinct, and the edge of the mantle is free from the nape, but in those families in which the aperture

of the shell is not closed by an operculum, both sexes are united in the same individual, and the edge of the mantle is united to the nape.

The lingual membrane in the *Pulmonifera* is very short and broad, and there is great uniformity in the general arrangement of the teeth. The teeth are very numerous and similar, and are placed in numerous transverse rows, which are straight in the *Helicidæ* and *Amphibolidæ*, diverging from the centre in *Testacellidæ*, slightly curved in *Siphonariidæ*, angularly bent near the centre in *Auriculidæ*, and semilunar in *Cyclophoridæ*. In the strictly-herbivorous tribes the teeth are similar in form, with broad bases and dentate crowns, as in *Limneidæ* and *Helicidæ*, but in the carnivorous families the teeth, on the contrary, are more or less pointed, as in *Oleacinidæ* and *Testacellidæ*.

The shell in the air-breathing Gasteropods, according to the researches of Gegenbaur, is not secreted on the exterior of the mantle as in other Gasteropods, but is deposited, in the form of calcareous granules, within its substance, a mode of development, as Huxley observes, which is without parallel among other Gasteropodous families, and, with the exception of the *Cephalopoda*, is unknown among the Mollusca. In some genera the shell is entirely wanting, as in *Onchidium;* in others it remains rudimentary and granular, as in *Arion;* in some again it is internal, flat, and partially membranous, as in *Limax;* in others it is external, small, and ear-like, as in *Testacella;* or it is partly internal, and partly external and shield-like, as in *Parmacella;* while in the greater number it forms a more or less developed spiral cone, into which the animal is enabled to retract. The cone may be elevated and with many coils, as in the higher genera of a series; or reduced to a simple, depressed

form, as in the lower or less developed members of a group: thus in *Bulimus* it is many-whorled, in *Omalonyx* rudimentary; in *Vitrina* spiral, while in *Parmacella* it is shield-like; in *Oleacina* produced, but in *Testacella* ear-shaped; in *Nanina* helicoid, while in *Arion* it is granular; in *Helix* spiral, but in *Limax* simple and flattened; in *Auricula* well-developed, but in *Otina* rudimentary; in *Limneus* elevated, but in *Ancylus* patelliform; in *Amphibola* turbinate, in *Siphonaria* conical and limpet-like.

Order INOPERCULATA.

Teeth nearly similar, very numerous, placed in many cross lines on a more or less elongated lingual band; mouth usually with transverse jaws. Respiratory organ in the form of an air-sac, or dorsal cavity lined by a vascular network; edge of mantle covering the pulmonary cavity, except at a lateral aperture. Animal hermaphrodite, with reciprocal impregnation.

Usually phytophagous, and respiring free air.

The Inoperculate Pulmonifers are usually active and well-organized Gasteropods, with distinct heads furnished with teeth, jaws, well-developed eyes and tentacles, and they crawl on an extended locomotive disk, or foot. The free air they breathe is passed over a network of vessels for the purpose of aërating the blood; and, in the majority of instances, they are protected by well-developed spiral shells. Chiefly herbivorous, they feed upon the vegetation of the earth. They either live upon the land (*Geophila*); or are inhabitants of fresh-water, coming to the surface, however, to breathe (*Limnophila*); or they are denizens of salt-marshes and places near the sea (*Thalassophila*).

In their distribution over the surface of the globe, they are found to be of larger size, and more numerous individually in the warm and humid regions of the tropics than in temperate climates, and seem especially to affect large wooded islands where the vegetation is varied, rapid in growth, and abundant. During the dry season they æstivate and conceal themselves from view; but after rain and in the dews of evening, they are especially active and voracious.

Sub-order GEOPHILA.

Eyes at the tips of elongated cylindrical peduncles; tentacles cylindrical, shorter than, and placed under, the eye-peduncles; sometimes wanting. Operculum none.

Animal terrestrial.

Fam. OLEACINIDÆ.

Lingual teeth numerous, in more or less curved, transverse rows, the central teeth inconspicuous, the marginal aculeate, or with a single, long, recurved apex. Head short, with a retractile, often produced, buccal sac; eyes at the tips of elongated, cylindrical, retractile peduncles, distinct from the tentacles; tentacles moderate, situated below the eye-peduncles. Body spiral, well developed, and protected by a shell; respiratory orifice on the right side beneath the margin of the shell. Foot elongate, narrow, simple posteriorly.

Shell spiral, usually thin and horn-coloured, or without markings, often polished; outer lip simple, acute.

Live in humid situations; often carnivorous.

Sub-fam. OLEACININÆ.

Mantle-margin included.

Shell fusiform, more or less horny and transparent;

aperture longitudinal, elongated and narrow; columella more or less truncated at the base, or tortuous.

Carnivorous, feeding on other mollusca.

Genus OLEACINA, Bolten.

Shell oblong-ovate or sub-cylindrical, covered with a smooth olivaceous epidermis; whorls 6—8, the last attenuated at the base, more or less equalling the spire; columella slender, arcuated forwards at the base; aperture narrow, elliptic-oblong; peristome simple, acute; outer lip usually inflexed.

Syn. Cochlicopa, *Férussac.*

Ex. O. lubrica, *Müller*, pl. 71, fig. 1. Shell, O. oleacea, *Férussac*, fig. 1, *a*.

This genus, as restricted, which represents the American *Glandina*, is composed of species which principally inhabit the north-coast of America, the Island of Cuba, and middle and southern Europe. *Nothus* inhabits Peru; the species of *Spiraxis* are from the Island of Jamaica; *Electra* is principally from the East Indies, Ceylon, and other islands of the Indian Seas; the species of *Férussacia* are European in their geographical distribution, living in damp places under earth and moss; and species of *Azeca* are found in England, Dalmatia, Greece, Northern Germany, and Madeira, living in damp places under fallen leaves.

Species of Oleacina.

assimilis, *Reeve.*
attenuata, *Pfeiff.*
crenulata, *Sow.*
delibuta, *Morel.*
glabra, *Pfeiff.*
incerta, *Reeve.*

labida, *Morel.*
Lindoni, *Pfeiff.*
obtusa, *Pfeiff.*
oleacea, *Férus.*
Riisei, *Pfeiff.*
sicilis, *Morel.*
solidula, *Pfeiff.*
voluta, *Chem.*

Sub-gen. NOTHUS, Albers.

Shell oblong-conical, thin, diaphanous, the last whorl shorter than the spire; columella short, doubly twisted.

Adamsiana, *Pfeiff.*
anomala, *Pfeiff.*
bulimoides, *Pfeiff.*
mirabilis, *C. B. Adams.*
Salleana, *Pfeiff.*
splendida, *Anton.*

Sub-gen. SPIRAXIS, C. B. Adams.

Shell elongated; spire acuminate, whorls longitudinally finely ribbed; columella tortuous, not truncate anteriorly.

aberrans, *Pfeiff.*
acus, *Shuttl.*
brevis, *C. B. Adams.*
costulosa, *C. B. Adams.*
inusitata, *C. B. Adams.*
paludinoides, *D'Orb.*
pellucens, *C. B. Adams.*
perplexa, *C. B. Adams.*

Sub-gen. ELECTRA, Albers.

Shell ovate-oblong, thin, diaphanous; spire pyramidal, apex obtuse, whorls numerous, the last inflated; columella short, arcuated, abruptly truncated.

amentum, *Bens.*
Bensoniana, *Pfeiff.*
Ceylonica, *Pfeiff.*
conifera, *Férus.*
consimilis, *Reeve.*
crassilabris, *Bens.*
crassula, *Bens.*
Deshayesii, *Pfeiff.*
frumentum, *Reeve.*
fusca, *Pfeiff.*
gemma, *Bens.*
Hugeli, *Pfeiff.*
inornata, *Pfeiff.*
Jerdoni, *Bens.*
nitens, *Gray.*
oreas, *Bens.*

orophila, *Bens.*
paritura, *Gould.*
Perrotteti, *Pfeiff.*
Puncto-Gallina, *Pfeiff.*
sericina, *Jonas.*
simpularia, *Morel.*

Sub-gen. FERUSSACIA, Risso (Zua, *Leach.* Vidantius, Risso (young). Pegea, *Risso.* Cionella, *Beck*, not *Jeffr.* Folliculus, *Hartm.*).

Shell ovate-oblong, smooth, polished, the whorls gradually increasing; columella somewhat twisted, obsoletely truncated anteriorly; inner lip callous.

Azorica, *Albers.*
balanus, *Bens.*
consobrina, *D'Orb.*
follicularis, *Morel.*
folliculus, *Gronov.*
Hohenwarti, *Rossm.*
lubrica, *Müll.*
lubricoides, *Stimp.*
Madeirensis, *Lowe.*
miliaris, *Jan.*
minima, *Siemaski.*
nitidissima, *Forbes.*
procerula, *Morel.*
pusilla, *Pfeiff.*
pygmacea, *Pfeiff.*
subulata, *Pfeiff.*
Tandoniana, *Shuttl.*
vitrea, *Webb and Berth.*

Sub-gen. STOBILUS, Anton (Cylichnidea, *Lowe.* Blauneria, *Shuttlew.*).

Shell ovately fusiform; columella uniplicate; outer lip simple, not labiate within, or furnished with teeth.

achatinoides, *Pfeiff.*
Cubensis, *Pfeiff.*
cylichna, *Lowe.*
Fraseri, *Bens.*
lamellifera, *Morel.*
Leacociana, *Lowe.*
ovuliformis, *Lowe.*

Sub-gen. AZECA, Leach (Amphorella, *Lowe.* Odontalus, *Parr.* Fusillus, *Lowe*).

Shell oval-elliptic, smooth, polished, last whorl shorter than the spire; columella compressed, truncato-dentate at the

fore part; aperture toothed or edentulate; peristome labiate within.

fusiformis, *Lowe.*
melanopsoides, *Lowe.*
mitriformis, *Lowe.*
oryza, *Lowe.*
pupæformis, *Cantr.*
terebella, *Lowe.*
tornatellina, *Lowe.*
tridens, *Pultn.*
triticea, *Lowe.*
tuberculata, *Lowe.*

Genus GLANDINA, Schumacher.

Mouth in the form of a short retractile muzzle; jaws none; eye-peduncles ending in a swelling, which is inflexed and prolonged beyond the eyes; a retractile attenuated labial palp on each side of the oral aperture.

Shell fusiform, imperforate, oblong-ovate, more or less turriculated, usually horny, and covered with a thin, fugaceous epidermis, last whorl attenuated at the base; aperture narrow, elliptic-oblong; columella slender, arcuated forwards, truncated at the base; peristome simple, acute.

Syn. Polyphemus, *Montf.*, not *Linn.*

Ex. G. Carminensis, *Morelet*, pl. 71, fig. 2. Shell, G. rosea, *Férussac*, fig. 2, *a*.

The animals of this genus, which nearly corresponds to the *Cochlicopa* of Férussac, are predaceous in their habits, and, like those of the family *Testacellidæ*, carnivorous; they attack with avidity *Bulimi* as large as themselves and devour them. When they have chosen a shell, they probe the aperture with their palps before penetrating it, the buccal mass is then protruded, and the contents consumed through the aperture they make with their teeth. The species inhabit America and the West Indies, living on the bushes near the sea. The group, *Melia*, is from the island of Jamaica, while a few species of *Acicula* are from Europe and Africa.

Species of Glandina.

aurata, *Morel.*
bullata, *Gould.*
Carminensis, *Morel.*
carnea, *Pfeiff.*
conspersa, *Pfeiff.*
coronata, *Pfeiff.*
corruscans, *Reeve.*
Daudebarti, *Desh.*
decussata, *Desh.*
fusiformis, *Pfeiff.*
interrupta, *Shuttl.*
Isabellina, *Pfeiff.*
Largillierti, *Pfeiff.*
Liebmanni, *Pfeiff.*
lignaria, *Reeve.*
Marminii, *Desh.*
monilifera, *Pfeiff.*
ornata, *Pfeiff.*
Petitii, *Desh.*
plicatula, *Pfeiff.*
rosea, *Férus.*
servilis, *Gould.*
Sowerbyana, *Pfeiff.*
straminea, *Desh.*
striata, *Müll.*
sulculosa, *Shuttl.*
terebræformis, *Shuttl.*
truncata, *Pfeiff.*
Vanuxemensis, *Lea.*

Sub-gen. MELIA, Albers.

Shell fusiformly turreted, longitudinally striated; columella tortuous, obliquely truncate; aperture narrow; outer lip anteriorly sinuous.

Blandiana, *C. B. Adams.*
curvilabris, *Pfeiff.*
delicatula, *Shuttl.*
Dominicensis, *Gmel.*
elegans, *C. B. Adams.*
fulminea, *Férus.*
Griffithsi, *C. B. Adams.*
Jamaicensis, *Pfeiff.*
leucozonias, *Walch.*
ligata, *C. B. Adams.*
nemorensis, *C. B. Adams.*
nitida, *C. B. Adams.*
Philippiana, *Pfeiff.*
Phillipsi, *C. B. Adams.*
procera, *C. B. Adams.*
propinqua, *C. B. Adams.*
puella, *C. B. Adams.*
rubella, *Morel.*
semisulcata, *Desh.*
similis, *C. B. Adams.*
stigmatica, *Shuttl.*
Tortillana, *Pfeiff.*
venusta, *Pfeiff.*
vicina, *C. B. Adams.*
Yucatanensis, *Pfeiff.*

Sub-gen. STREPTOSTYLA, Shuttleworth.

Shell ovate-oblong, or sub-cylindrical, the last whorl attenuated; aperture narrow, the right margin often inflexed; columella strongly contorted, furnished with a callous lamina, deeply intrant, and scarcely truncate anteriorly.

coniformis, *Shuttl.*
Cubaniana, *D'Orb.*
cylindracea, *Pfeiff.*
Dysoni, *Pfeiff.*
episcopalis, *Morel.*
flavescens, *Shuttl.*
irrigua, *Shuttl.*
Lattrei, *Pfeiff.*
ligulata, *Morel.*
lurida, *Shuttl.*
lymneiformis, *Shuttl.*
meridana, *Morel.*
mitriformis, *Shuttl.*
Nicoleti, *Shuttl.*
nigricans, *Pfeiff.*
Peruviana, *Lam.*
physodes, *Shuttl.*
Richardi, *Pfeiff.*
streptostyla, *Pfeiff.*
suturalis, *Pfeiff.*
ventricosula, *Morel.*

Sub-gen. ACICULA, Risso (Cionella, *Jeffr.*, not *Beck.* Hydastes, *Parr.* Columna, *Crist. and Jan*, not *Perry.* Achatinella, *Schlüt.*, not *Swains.*).

Shell subulate, white, striated, thin; spire acuminate; columella truncate at the base, peritreme simple, acute.

acicula, *Müll.*
aciculoides, *Jan.*
Algira, *Brug.*
arcuata, *Pfeiff.*
candida, *Shuttl.*
cylindrella, *Morel.*
dilatata, *Ziegl.*
Gayana, *C. B. Adams.*
Gossei, *Pfeiff.*
gracilior, *C. B. Adams.*
gracilis, *Lowe.*
Gundlachi, *Pfeiff.*
impressa, *Pfeiff.*
iota, *C. B. Adams.*
lævis, *C. B. Adams.*
longispira, *C. B. Adams.*
micans, *C. B. Adams.*
osculans, *C. B. Adams.*
producta, *Lowe.*
striosa, *C. B. Adams.*
subulatoides, *D'Orb.*
turris, *Pfeiff.*

Genus SUBULINA, Beck.

Shell diaphanous, cylindrically turreted, rarely elongately conical; apex obtuse, whorls 8—9, convex, the last nearly equal to $\frac{1}{3}$ of the length; columella sub-arcuated, obliquely truncate above the base; aperture oval; peristome straight, acute.

Ex. S. striatella, *Rang*, pl. 71, fig. 3. Shell, S. octona, *Chemnitz*, fig. 3, *a*.

Some of the species are from the East Indies and China, a few are from Mexico, and the rest are from Cuba, Jamaica and other West Indian islands, and from Western Africa. The Brazilian forests, especially those of Bahia, are the haunts of the *Obeliscus* or *Stenogyra* group.

Species of Subulina.

acicularis *Shuttl.*
bacilliformis, *Jonas.*
Cassiaca, *Bens.*
cerea, *Pfeiff.*
clavata, *Gray.*
confusa, *Pfeiff.*
Dunkeri, *Pfeiff.*
exilis, *Pfeiff.*
Fraseri, *Pfeiff.*
Javanica, *Reeve.*
lirifera, *Morel.*
octona, *Chem.*
Portoricensis, *Pfeiff.*
Rangiana, *Pfeiff.*
semitarum, *Rang.*
striata, *Lea.*
striatella, *Rang.*
sulcata, *Gray.*
tenuispira, *Bens.*
terebraster, *Férus.*
trochlea, *Pfeiff.*
turritellata, *Desh.*
vivipara, *Sow.*

Sub-gen. STENOGYRA, Shuttleworth (Obeliscus, *Beck*, not *Montf.*).

Shell imperforate, elongately turreted; apex obtuse, whorls numerous; aperture oval; columella straight, thin.

bacterioides, *D'Orb.*
calcarea, *Born.*

carphodes, *Pfeiff.*
clava, *Reeve.*
columella, *Phil.*
cuneus, *Pfeiff.*
erecta, *Bens.*
Fortunei, *Pfeiff.*
obeliscus, *Moric.*
obtusata, *Gmel.*
planospira, *Pfeiff.*
riparia, *Pfeiff.*
Salleana, *Reeve.*
subuliformis, *Moric.*
Swiftiana, *Pfeiff.*
sylvatica, *Spix.*

Sub-gen. OPEAS, Albers.

Shell imperforate or perforate, thin, rather small, subulate, striated or ribbed, last whorl not equalling one quarter of the length; peristome simple, acute.

achatinacea, *Pfeiff.*
alabastrina, *Shuttl.*
Beckiana, *Pfeiff.*
clavulus, *Férus.*
columellaris, *Reeve.*
elegantula, *Pfeiff.*
Gompharium, *Shuttl.*
Goodallii, *Miller.*
gracillima, *Pfeiff.*
oryza, *Brug.*
margaritacea, *Shuttl.*
micra, *D'Orb.*
mimosorum, *D'Orb.*
octonoides, *C. B. Adams.*
Oparana, *Pfeiff.*
Panayensis, *Pfeiff.*
subdiaphana, *King.*
subula, *Pfeiff.*

Sub-gen. RUMINA, Risso (Orbitina, Risso (young). Cylindrina, *Schlüt.*).

Shell obsoletely rimate, truncate, cylindrically elongate; peristome straight, thickened, the margins joined by a callus, the columellar double, as short as the other.

decollata, *Linn.*
mutilata, *Reeve.*

Sub-gen. PSEUDOBALEA, Shuttleworth.

Shell rimate or imperforate, sometimes sinistrorsal.

Dominicensis, *Pfeiff.*

Sub-fam. HELICELLINÆ.

Mantle-margin included.

Shell discoidal or trochiform, umbilicated, usually thin, many-whorled; peristome straight, acute.

Genus SAGDA, Beck.

Shell imperforate, globosely-conoidal; whorls 8—9, the last sub-angulated, lamellate within; columella short, oblique, dilated at the base; aperture depressed, lunar; peristome simple, acute.

Ex. S. gularis, *Say*, pl. 71, fig. 4. Shell, S. epistylium, *Müller*, fig. 4, *a*.

Sagda, remarkable for the number of its whorls and the lamina in the mouth, comprises but a few species; they are from the Island of Jamaica. The North American States, viz. Vermont, Massachussetts, and Pensylvania, harbour the species of *Gastrodonta*.

Species of Sagda.

alligans, *C. B. Adams.*
connectans, *C. B. Adams.*
Cookiana, *Gmel.*
epistyliolum, *C. B. Adams.*
epistylium, *Müll.*
epistyloides, *Férus.*
Foremaniana, *C. B. Adams.*
lamellifera, *C. B. Adams.*

osculans, *C. B. Adams.*
pila, *C. B. Adams.*
torrefacta, *C. B. Adams.*

Sub-gen. GASTRODONTA, Albers (Janulus, *Lowe*).

Shell orbiculately convex, rugosely striated, sub-perforate, or umbilicated; aperture with pliciform teeth at the base; peristome simple, acute.

bifrons, *Lowe.*
cultrata, *Gould.*
exæquata, *Gould.*
gularis, *Say.*
interna, *Say.*
lasmodon, *Phillips.*
lineata, *Say.*
macilenta, *Shuttl.*
multidenta, *Gould.*
stephanophora, *Desh.*

Genus PITYS, Beck.

Shell umbilicate, very rarely sub-perforate, depressed, discoidal, or orbiculately convex; whorls generally narrow; aperture lunate, usually angulated, rarely rounded; inner lip lamellate, sometimes the basal margin likewise lamellately dentate; peristome straight, acute.

Syn. Laoma, *Gray.* Entodonta, *Albers.*

Ex. P. lamellosa, *Férussac,* pl. 71, fig. 5.

The geographical locality of this group is in all the islands of the Pacific Ocean, Tahiti, Opara, the Sandwich Islands, &c.

Species of Pitys.

bilamellata, *Pfeiff.*
bursatella, *Gould.*
cavernula, *Homb. and Jacq.*
contorta, *Férus.*
dœdalea, *Gould.*
Helenensis, *Forbes.*
hystrix, *Migh.*
Jaquinoti, *Pfeiff.*
jugosa, *Migh.*
lamellosa, *Férus.*
Leimonias, *Gray.*
obolus, *Gould.*

Oparica, *Anton.*
pentodon, *Mke.*
rubiginosa, *Gould.*
sexlamellata, *Pfeiff.*
stellata, *Gould.*
tichostoma, *Pfeiff.*

Genus ZONITES, Montfort.

Shell widely umbilicated, orbiculately convex or discoidal, variously decussated or striated above, smooth and shining below; whorls gradually increasing; aperture obliquely lunar; peristome straight, slightly thickened internally.

Syn. Mesomphix, *Rafin.* Tragomma, *Held.* Ægopis, *Fitz.* Ægopsis, *Hartm.*

Ex. Z. Algira, *Linnæus*, pl. 71, fig. 6. Shell, Z. Algira, fig. 6, *a*.

The species of this genus, as restricted, are entirely European, being found in France, Istria, Illyria, Dalmatia, &c.; their usual habitat is under fallen leaves and among decaying vegetable matter. The species of *Trochomorpha* are from the islands in the Pacific, the Philippines, Moluccas, Java, and a few are from Bermuda and Central America; Bourbon, Bengal, and the Cape are the localities given for the species of *Rotula;* the species of *Videna* are from the Indian and Western Australian islands, the Philippines, New Guinea, Java, and China.

Species of Zonites.

acies, *Partsch.*
Albanica, *Ziegl.*
Algira, *Linn.*
carica, *Roth.*
Chiron, *Gray.*
compressa, *Ziegl.*
concolor, *Férus.*
Cressida, *Gould.*
Croatica, *Partsch.*
fuliginosa, *Griff.*
Gemonensis, *Férus.*
obscurata, *Adams and Reeve.*

Smyrnensis, *Roth.*
Tugurum, *Bens.*
verticillus, *Férus.*

Sub-gen. TROCHOMORPHA, Albers.

Shell umbilicate or sub-imperforate, trochiform; apex more or less obtuse; whorls flattened, the last keeled; peristome acute, the columellar margin, rarely, thickened or toothed.

approximata, *Le Gillou.*
Bermudensis, *Pfeiff.*
Boholensis, *Pfeiff.*
conus, *Phil.*
Eurydice, *Gould.*
Gouldi, *Pfeiff.*
Guerini, *Pfeiff.*
insculpta, *Pfeiff.*
Küsteri, *Pfeiff.*
nigritella, *Pfeiff.*
ochroleuca, *Férus.*
Pacifica, *Pfeiff.*
rectangula, *Pfeiff.*
solarium, *Quoy.*
spirulata, *Pfeiff.*
trochiformis, *Férus.*

Sub-gen. ROTULA, Albers.

Shell perforate or imperforate, lenticular or trochiform, acutely keeled; whorls regularly increasing, the last abruptly convex, impressed next the columella; peristome thin, marginate, acute.

Bensoni, *V. d. Busch.*
detecta, *Férus.*

Sub-gen. VIDENA, H. and A. Adams (Discus, *Albers*, not *Fitz.*).

Shell widely umbilicated, discoidal, keeled, flat, or slightly elevated above, convex at the base, last whorl slightly deflexed at the aperture; peristome simple, acute, or slightly marginate, the margins arcuated.

acutimargo, *Pfeiff.*
albocincta, *Pfeiff.*
Beckiana, *Pfeiff.*
exclusa, *Férus.*

Hartmanni, *Pfeiff.*
Metcalfi, *Pfeiff.*
Osbeckii, *Phil.*
Papua, *Less.*
planorbis, *Less.*
radula, *Pfeiff.*
rotatoria, *V. d. Busch.*
strigilis, *Pfeiff.*
Swainsoni, *Pfeiff.*

Sub-gen. CONULUS, Fitzinger (Petasia, *Beck.* Trochiscus, *Held.*, not *Sow.* Perforatella, *Schlüt.*).

Shell thin, perforate, turbinately globose, arctispiral; aperture obliquely lunar; peristome internally labiate, patulous or subreflexed, rarely simple, basal margin often dentate.

bidens, *Chem.*
calculosa, *Gould.*
Cobresiana, *Alten.*
edentula, *Drap.*
Egena, *Say.*
fulva, *Drap.*
fusca, *Mont.*
Gundlachi, *Pfeiff.*
leucozona, *Ziegl.*
ligera, *Say.*
stenotrema, *Férus.*
subtilissima, *Gould.*

Genus DISCUS, Fitzinger.

Shell widely umbilicated, depressed, discoid or turbinate, rugose or costulately striate; whorls equal or gradually increasing; aperture lunately rotund; peristome simple, straight, acute.

Syn. Patula, *Held.* Euryomphala, *Beck.* Pyramidula, *Fitz.* Gonyodiscus, *Fitz.* Acanthinula, *Beck.* Phlebecula, *Lowe.* Lucilla, *Lowe.*

Ex. D. rotundatus, *Müller*, pl. 71, fig. 7. Shell, D. rotundatus, fig. 7, *a.*

This genus is chiefly confined to temperate regions; the species are inhabitants of the whole of Europe and North America; a few are from Central America, Brazil, Bolivia,

and the Island of Chiloe; some are found in New Zealand, while a few again are from the Sandwich and Philippine Islands.

Species of Discus.

aculeatus, *Müll.*
alpha, *Pfeiff.*
alternatus, *Say.*
beta, *Pfeiff.*
biconcavus, *Pfeiff.*
Binneyanus, *Pfeiff.*
Canicalensis, *Lowe.*
Celinde, *Gray.*
Chilensis, *Mühlf.*
coarctiliatus, *Pfeiff.*
Coma, *Gray.*
dissimilis, *D'Orb.*
Edelii, *Roth.*
Egesta, *Gray.*
epidermius, *Anton.*
fornicatus, *Gould.*
fragilis, *Pfeiff.*
Frivaldskyanus, *Rossm.*
gamma, *Pfeiff.*
Giranicus, *Lowe.*
gradatus, *Gould.*
Guerinianus, *Lowe.*
histrix, *Migh.*
Ida, *Gray.*
iota, *Pfeiff.*
kappa, *Pfeiff.*
lambda, *Pfeiff.*
lamellatus, *Jeffr.*
monilis, *Brod.*
mordax, *Shuttl.*
nitidiusculus, *Lowe.*
omalomorpha, *D'Orb.*
orbicula, *D'Orb.*
orthostoma, *Pfeiff.*
perspectivus, *Say.*
planorboides, *Rafin.*
pœcilostictus, *Pfeiff.*
Portia, *Gray.*
pusillus, *Lowe.*
pygmæus, *Drap.*
quadratus, *Férus.*
quinquestrigatus, *Beck.*
radiellus, *Pfeiff.*
rariplicatus, *Bens.*
rotundatus, *Müll.*
rubiginosus, *Gould.*
ruderatus, *Stud.*
rupestris, *Drap.*
saxicola, *Pfeiff.*
scintilla, *Lowe.*
sigma, *Pfeiff.*
sincerus, *C. B. Adams.*
solitarius, *Say.*
striatellus, *Anthon.*
suturalis, *Pfeiff.*
Swerzenbachii, *Calc.*
tessellatus, *Mühlf.*
theta, *Pfeiff.*
turbiniformis, *Pfeiff.*
Vancouverensis, *Lea.*
varicosus, *Pfeiff.*
vitrinus, *Wagn.*
zeta, *Pfeiff.*

Genus HELICELLA, Lamarck.

Tentacles short; edge-teeth of tongue aculeate. Mantle thickened and slightly reflected; tail obliquely truncated.

Shell depressed, vitreous, shining, umbilicated; whorls regularly increasing, the last not descending at the aperture; aperture rotundately lunar; peristome thin, straight.

Syn. Hyalina, *Férus.*, not *Schum.* Zonites, *Gray*, not *Montf.* Polita, *Held.* Vitrea, *Fitz.* Hyalinia, *Agass.*

Ex. H. cellaria, *Müller*, pl. 71, fig. 8. Shell, H. cellaria, fig. 8, *a*.

The *Helicellæ* are small Snails, most frequently with transparent shells, inhabiting the damp moss and dead leaves in woods and shady places in Europe, North America, and the West Indies.

Species of Helicella.

alliaria, *Müll.*
arborea, *Say.*
Besckei, *Dkr.*
bilineata, *Pfeiff.*
Boothiana, *Pfeiff.*
caduca, *Pfeiff.*
Cayennensis, *Pfeiff.*
cellaria, *Müll.*
cicercula, *Gould.*
circumlineata, *Küst.*
crystallina, *Müll.*
cyclostomoides, *Pfeiff.*
Cypria, *Pfeiff.*
demissa, *Binney.*
fricata, *Gould.*
fuliginosa, *Griff.*
fuscosa, *Ziegl.*
Haldemanniana, *C.B. Adams.*
hiulca, *Jan.*
hyalina, *Férus.*
hydatina, *Rossm.*
inornata, *Say.*
intertexta, *Binney.*
lævigata, *Rafin.*
ligera, *Say.*
minuscula, *Binney.*
nitens, *Mich.*
nitida, *Müll.*
nitidula, *Drap.*
obscurata, *Porro.*
olivetorum, *Gmel.*
opaca, *Shuttl.*
peraffinis, *C. B. Adams.*
pertenuis, *Gould.*

placentula, *Shuttl.*
plerophora, *Moric.*
protensa, *Férus.*
pura, *Alder.*
saxatilis, *Couth.*
splendidula, *Pfeiff.*
subrutila, *Migh.*
testæ, *Phil.*
trochilioides, *D'Orb.*
unidentata, *Say.*
vortex, *Pfeiff.*

Sub-fam. VITRININÆ.

Animal too large entirely to enter the shell. Mantle-margin more or less produced, reflexed over the sides, or sometimes entirely covering the shell. Tail often obliquely truncate, but not furnished with a caudal gland.

Shell thin, usually horny and transparent; aperture very wide.

Genus PFEIFFERIA, Gray.

Animal large for the size of the shell. Mantle-edge expanded, thin, reflexed over the outer surface of the shell, forming an even margin beyond the peristome. Foot moderate, depressed behind, acute at the tip, without any caudal gland.

Shell globose, imperforate, thin, brittle, white, pellucid; spire with the whorls small, the third and fourth rapidly enlarging, the last inflated; aperture rounded, lunate; columella slightly and regularly arcuated; peristome thin, straight, acute.

Ex. P. micans, *Pfeiffer*, pl. 72, fig. 1. Shell, P. micans, fig. 1, *a*.

Mr. Cuming discovered this animal in great abundance on the leaves of bushes at the extreme north part of the Island of Luzon.

Genus VITRINA, Draparnaud.

Mantle with the front edge greatly extended and covering the neck often as far as the tentacles.

Shell pellucid, hyaline; whorls few, rapidly increasing, the last dilated; aperture wide; peristome thin, simple, acute.

Syn. Virtrinus, *Montf.* Helicolimax, *Férus.* Semilimax, *Férus.* Limacina, *Hartm.*, not *Cuvier.* Hyalina, *Stud.*, not *Schum.* or *Férus.* Pagana, *Gist.*

Ex. V. fasciata, *Eydoux and Souleyet*, pl. 72, fig. 2. Shell, V. pellucida, *Müller*, fig. 2, *a*.

In its geographical distribution the genus *Vitrina* is found in every part of the globe, the species being most numerous north of the Equator. They live in moist situations, among loose earth, stones, grass, and moss. They are very lively, crawling constantly about, and when touched will sometimes jump several inches from the ground. The tail of the animal is obliquely truncated, and the edge-teeth of the tongue are aculeate.

Species of Vitrina.

æmulans, *Müll.*
Beckiana, *Pfeiff.*
Behnii, *Lowe.*
Birmanica, *Phil.*
caperata, *Gould.*
cornea, *Pfeiff.*
Cumingi, *Beck.*
diaphana, *Drap.*
Draparnaldi, *Cuv.*
Edgariana, *Bens.*
elongata, *Drap.*
fasciata, *Eyd. and Soul.*
fumosa, *Pfeiff.*
grandis, *Beck.*
Gruneri, *Pfeiff.*
gutta, *Pfeiff.*
Lamarckii, *Férus.*
limpida, *Gould.*
Luzonica, *Pfeiff.*
marginata, *Beck.*

membranacea, *Bens.*
Natalensis, *Krauss.*
nitida, *Gould.*
pellucida, *Müll.*
Pœppigii, *Mke.*
politissima, *Beck.*
Pyrenaica, *Férus.*
resiliens, *Beck.*
Ruivensis, *Couth.*
sigaretina, *Recluz.*
Sowerbyana, *Pfeiff.*
Strangei, *Pfeiff.*
tenella, *Gould.*
Verrauxii, *Pfeiff.*

Genus HELICOPHANTA, Férussac.

Eye-peduncles short; tentacles rudimentary; pulmonary orifice on the right border of the mantle, a little posterior; body elongated, greatly developed.

Shell on the hind part of the body, perforate, horny, depressed, paucispiral, horizontally and rapidly involute, last whorl very large; aperture oblique, very wide.

Syn. Daudebardia, *Hartm.*

Ex. H. brevipes, *Draparnaud*, pl. 72, fig. 3. Shell, H. rufa, *Draparnaud*, fig. 3, *a*.

Helicophanta, which consists of but three species, comes from Germany, Switzerland, Hungary, and the north of Italy. It inhabits hilly regions, in moist places, hiding under stones and moss.

Species of Helicophanta.

brevipes, *Drap.*
Langi, *Pfeiff.*
rufa, *Drap.*

Genus PARMACELLA, Cuvier.

Mantle shield-like, on the hind part of the body; orifice of respiratory sac at the right posterior margin. Back with a dermal protuberance between the hook and the margin

of the shell, and a reflexed appendage, which covers the under side of the spire. Foot abbreviate posteriorly.

Shell internal, scutiform, oval, sub-spiral, flat, dilated anteriorly.

Ex. P. Valenciennii, *Webb and Van Beneden*, pl. 72, fig. 4. Shell, P. Valenciennii, fig. 4, *a*.

The *Parmacellæ*, as properly restricted, inhabit Northern Africa, with the exception of *P. Valenciennii*, which is found in Portugal. They are herbivorous, feeding on the young shoots of the *Cochlearia acaulis*. The shell is furnished with a small hooked process, and there is a corresponding protuberance of skin on the back of the animal, which fits between the hook and the margin of the shell, and serves to retain it in its place; an appendage of the skin forms a fold, moreover, and is applied against the under side of the callous rudimentary spire. M. Rang has observed the species inhabiting Bourbon and Madagascar (*P. Rangiana*) on the rocks at the margins of fresh-water streams.

Species of Parmacella.

Alexandrina, *Ehrenb.*
Olivieri, *Cuv.*
Rangiana, *Férus.*
Valenciennii, *Webb and Van Beneden.*

Genus CRYPTELLA, Webb and Berthelot.

Mantle shield-like, ovoid, covering half the body, anteriorly free and linguiform, posteriorly saccate and covering the shell, and received into a groove or pit on the hind part of the body; orifice of respiratory sac at the right posterior margin. Foot tapering, triangular, keeled above, pointed at the end.

Shell internal, oval, depressed, shining, transparent, subspiral, olivaceous, with a large, white, spatulate lamella developed, in the adult, from the fore part.

Ex. C. ambigua, *Férussac*, pl. 72, fig. 5. Shell, C. ambigua, fig. 5, *a*.

In the very young animal, the shell is without the spatulate, lamelliform concretion in front, and is provided with a thin, horny, convex operculum, which afterwards disappears. The *Cryptella* is an inhabitant of the Canary Islands; during eight or nine months in the year their vital activity is suspended, and they conceal themselves under the large blocks of lava with which these islands are covered; they are herbivorous, and during the rainy season, especially in the night, they quit their retreats and commit great havock in the gardens. The peasants destroy them by thousands, but, notwithstanding this persecution, their numbers do not appear to diminish.

Genus PELTELLA, Webb and Van Beneden.

Animal limaciform, depressed. Mantle appendiculate on the right side under the spire; orifice of respiratory sac at the right posterior margin. Foot flattened, dilated, simple posteriorly.

Shell sub-spiral, ear-like, thin, hyaline, covered anteriorly by a fold of the mantle, deeply immersed, and partially concealed posteriorly in a depression of the back, on the under side showing the free columellar margin of all the whorls.

Syn. Pectella, *Gray*. Gæotis, *Shuttleworth*.

Ex. P. palliolum, *Férussac*, pl. 72, fig. 6. Shell, P. nigrolineata, *Shuttleworth*, fig. 6, *a*.

This genus comprises the *Parmacellæ* of the New World.

The American forms are said to be most frequently found partly buried in damp earth in the woods of Brazil; the West-Indian species were discovered by M. Blauner crawling at night, and in the morning, on the trunks and foliage of the Bananas or Plantains. From an examination of the armature of the tongue, in which the lateral teeth are subulate and arched, Mr. Shuttleworth concludes these animals to be carnivorous.

Species of Peltella.

albopunctulata, *Shuttl.*
aperta, *Beck.*
Cumingii, *Pfeiff.*
flavolineata, *Shuttl.*
nigrolineata, *Shuttl.*
palliolum, *Férus.*

Fam. TESTACELLIDÆ.

Animal elongated and slug-like. Lingual membrane broad; teeth numerous, in several diverging cross series, pin-shaped, slightly curved, with a roundish head and an acute tip, only attached to the lingual membrane by a small central process. Eye-peduncles moderately long; tentacles short. Mantle habitually concealed under the shell; respiratory orifice situated behind and below the shell, on the posterior part of the thickened mantle-margin. Reproductive orifice behind and near the right tentacle.

The animals of this family, as might have been expected from the nature of the armature of the lingual membrane, are carnivorous in their habits, living chiefly on worms, which they often swallow whole; they are subterranean, living near the surface in the summer and crawling on the ground in autumn, but entirely burying themselves during the winter.

Genus TESTACELLA, Cuvier.

Mantle divided into numerous lobes, usually concealed by the shell, but capable of being drawn forward over the body.

Shell external, auriform, depressed, sub-spiral, situated at the hinder extremity of the back.

Syn. Testacellus, *Faure-Biguet.*

Ex. T. Maugei, *Férussac*, pl. 72, fig. 7. Shell, T. Maugei, fig. 7, *a*.

The shell, which appears affixed to the tail, on account of the posterior position of the respiratory cavity, is ear-shaped, and covered with a thin epidermis; the apex is very small and spiral, the aperture is very large and oblong, the outer lip is entire, the inner lip is thickened and involute, and the muscular impression is oblong-lunate.

Species of Testacella.

haliotoidea, *Drap.*
Lartetii, *Dupuy.*
Maugei, *Férus.*
scutulum, *Sow.*

Genus PLECTROPHORUS, Bosc.

Mantle shield-like, at the anterior part of the body; orifice of respiratory sac at the right anterior border. Body with a small, external, prominent, testaceous appendage, situated towards the posterior extremity.

Ex. P. corninus, *Bosc*, pl. 72, fig. 8. Shell, P. corninus, fig. 8, *a*.

Plectrophorus is at once recognised by the remarkable horny shell placed on the hind portion of the foot; three

species are figured by Férussac in his great work, each with a caudal shell, but more information is required concerning them.

Species of Plectrophorus.

corninus, *Bosc.* Orbignyi, *Férus.*
costatus, *Bosc.*

Fam. HELICIDÆ.

Body spiral, distinct from the foot. Teeth on lingual membrane in numerous, straight, transverse lines, equal, uniform, and with the edge-teeth serrated or dentate. Head well-developed; mouth with a dentate upper jaw or mandible; eye-peduncles and tentacles retractile under the skin. Mantle-margin not extended, or produced into lobes; respiratory orifice on the right side, under the edge of the shell. Foot elongated, with the hind part simple and pointed behind, not glanduliferous. Orifice of reproductive organs at the base of the right eye-peduncle.

Shell external, well developed, spiral.

Animal entirely retractile within the shell. Herbivorous.

The animals of this family, comprising the "True Snails," are strictly phytophagous, subsisting chiefly on the foliage of trees and plants. Their lingual teeth, very numerous and nearly similar, are placed in many cross lines on the more or less elongated lingual band; the transverse lines are usually straight, and the form of the teeth varies according to the genus; in general, the teeth have a broad, expanded, more or less four-sided, oblong base, with a reflexed tip, the bases of the teeth in the same series being close together on the lingual band so as to form a close-set rasp. The animals are entirely retractile within the shell, the

mantle is not produced into lobes, or developed and reflexed over the aperture, the caudal gland is absent, and the shell is adorned with varied markings, and assumes nearly every modification conceivable in the form of a hollow, spiral cone. The *Helicidæ* abound most in humid tropical regions, especially in islands; they are, however, universally distributed wherever there is vegetation, from the equator to the poles, from the bosom of luxuriant valleys to the summit of barren mountains.

Sub-fam. SUCCININÆ.

Lingual teeth as in *Helix*. Animal bulky; tentacles short and thick; foot broad.

Shell thin, horny, ovate or oblong; spire small; aperture large, oval; columella simple, not truncate anteriorly; peristome acute.

Inhabit damp places in the vicinity of water.

Genus SIMPULOPSIS, Beck.

Shell semi-oval, very thin, membranaceous; whorls few, the last ventricose; aperture wide, oblique, roundly oval; columella arcuated; peristome simple, acute.

Ex. S. sulculosa, *Férussac*, pl. 73, fig. 1.

The species of this genus are from Portorico and the province of Bahia in Brazil. They have been generally considered as mostly allied to *Vitrina*, but the recent observation of the animal by Mr. Shuttleworth proves them to be near *Succinea*. The mantle is not appendiculate as in *Vitrina*; the teeth and lingual membrane, however, are generically different from those of *Succinea*.

Species of Simpulopsis.

approximans, *Shuttl.*
atrovirens, *Moric.*
hyalina, *Shuttl.*
obtusa, *Sow.*
Portoricensis, *Shuttl.*
rufescens, *Moric.*
sulculosa, *Férus.*

Genus SUCCINEA, Draparnaud.

Animal nearly retractile within the shell.

Shell imperforate, oval, horny; spire short, last whorl large; aperture wide, oblong; columella simple, acute; peristome simple, acute.

Syn. Lucena, *Oken.* Amphibulima, *Lam.*, not *Blainv.* Tapada, *Stud.* Amphibulimus, *Montf.*, *Blainv.* Amphibina, *Hartm.*

Ex. S. picta, *Pfeiffer*, pl. 73, fig. 2. Shell, S. putris, *Linnæus*, fig. 2, *a*.

The animals of this genus are sub-aquatic and amphibious in their habits, living among plants near the water. The species are very numerous, and are found in all parts of the globe, abounding especially in temperate climates.

Species of Succinea.

acuta, *Pfeiff.*
angustior, *C. B. Adams.*
arenarea, *Bouch.*
aurea, *Lea.*
avara, *Say.*
Barbadensis, *Guild.*
Bensoni, *Pfeiff.*
brevis, *Dkr.*
caduca, *Migh.*
campestris, *Say.*
Candeana, *Lea.*
canella, *Gould.*
Chilensis, *Phil.*
cingulata, *Forbes.*
concisa, *Mouss.*
concordialis, *Gould.*
crocata, *Gould.*
exarata, *Krauss.*

explanata, *Gould.*
fulgens, *Lea.*
Gouldiana, *Pfeiff.*
gracilis, *Lea.*
Gundlachi, *Pfeiff.*
helicoidea, *Gould.*
humerosa, *Gould.*
Indica, *Pfeiff.*
inflata, *Lea.*
infundibuliformis, *Gould.*
Italica, *Jan.*
latior, *C. B. Adams.*
lumbalis, *Gould.*
luteola, *Gould.*
Magellanica, *Gould.*
Manuana, *Gould.*
modesta, *Gould.*
Nuttalliana, *Lea.*
obliqua, *Say.*
oblonga, *Drap.*
Oregonensis, *Lea.*
ovalis, *Say.*
papillata, *Pfeiff.*
Pfeifferi, *Rossm.*
picta, *Pfeiff.*
pinguis, *Pfeiff.*
procera, *Gould.*
pudorina, *Gould.*
pusilla, *Pfeiff.*
putris, *Linn.*
rugosa, *Pfeiff.*
rusticana, *Gould.*
Sagra, *D'Orb.*
Salleana, *Pfeiff.*
semiglobosa, *Pfeiff.*
solidula, *Pfeiff.*
spurca, *Gould.*
striata, *Krauss.*
subgranosa, *Pfeiff.*
Tahitensis, *Pfeiff.*
Tasmaniana, *Pfeiff.*
Texasiana, *Pfeiff.*
tigrina, *Lesson.*
Totteniana, *Lea.*
venusta, *Gould.*
vesicalis, *Gould.*
Wardiana, *Lea.*

Genus AMPHIBULIMA, Blainville.

Shell ovate, inflated, rugose; spire very short, the last whorl angulated; aperture wide, sub-quadrangular.

Ex. A. patula, *Bruguière*, pl. 73, fig. 3.

This genus is founded on a very rare and curious species of *Succinea* from the Island of Guadaloupe, the animal of which, however, has not hitherto been observed; the other species is from the Island of Martinique.

Species of Amphibulima.

patula, *Brug.*
rubescens, *Desh.*

Genus HELISIGA, Lesson.

Eye-peduncles short, cylindrical, swollen at the base; tentacles short, rudimentary.

Shell ovate, ventricose; spire very short; aperture wide, patulous; peristome simple, acute.

Ex. H. Sanctæ-Helenæ, *Lesson*, pl. 73, fig. 4. Shell, H. fragilis, *Eydoux and Souleyet*, fig. 4, *a*.

There is a group of *Succineæ* from the Society and Sandwich Islands, which agrees in the form of the shell with this genus, but the mantle-margin is extended and covers the outer lip. The same is probably the case in the *Helisiga* of South America.

Species of Helisiga.

aperta, *Lea.*
cepulla, *Gould.*
fragilis, *Eyd. and Soul.*
rotundata, *Gould.*
Sanctæ Helenæ, *Lesson.*

Genus OMALONYX, D'Orbigny.

Mantle forming a thickened border round the shell, covering the margins; pulmonary orifice under the right border of the mantle towards the middle part.

Shell oval, depressed, unguiform; spire none; aperture wide, open.

Syn. Pelta, *Beck*, not *Quatrefages*.

Ex. O. unguis, *D'Orbigny*, pl. 73, fig. 5. Shell, O. unguis, fig. 5, *a*.

The *Omalonyx* is found in the marshes of Meridional America; it crawls rapidly and is more aquatic than other *Succineæ*, dying when removed from the vicinity of the water.

Species of Omalonyx.

appendiculata, *Pfeiff.*
Bernardi, *Recluz.*
Cumingi, *Pfeiff.*
depressa, *Rang.*
explanata, *Gould.*
Gayana, *D'Orb.*
putamen, *Gould.*
unguis, *D'Orb.*

Sub-fam. ACHATININÆ.

Shell more or less conoidal, solid, not horny or transparent, the last whorl usually very ventricose; aperture wide; columella usually more or less truncate at the fore part; outer lip generally simple and acute.

Genus ACHATINA, Lamarck.

Shell oblong-ovate; spire conical, very rarely turreted, last whorl more or less ventricose, nearly equal to the spire; aperture acutely ovate; columella conspicuously intorted, arcuated, and abruptly truncate; peristome acute, the margins united by a diffused callus.

Syn. Achatinus, *Montf.* Cochlitoma, *Férus.* Oncœa, *Gist.* Archachatina, *Albers.*

Ex. A. panthera, *Férussac*, pl. 73, fig. 6. Shell, A. zebra, *Chemnitz*, fig. 6, *a*.

The species of this genus, which comprises some of the largest terrestrial Mollusks, live near water about trees; they are chiefly African in their geographical distribution, being represented in America by the groups of *Corona* and *Orthalicus*.

Species of Achatina.

acuta, *Lam.*
albicans, *Pfeiff.*
allisa, *Reeve.*
Cumingi, *Shuttl.*
fulgurata, *Pfeiff.*
fulva, *Brug.*
glutinosa, *Pfeiff.*
granulata, *Pfeiff.*
immaculata, *Lam.*
indotata, *Reeve.*
iostoma, *Pfeiff.*
Knorri, *Jonas.*
Kraussi, *Reeve.*
lactea, *Reeve.*
Lamarckiana, *Pfeiff.*
magnifica, *Pfeiff.*
marginata, *Swains.*
pachycheila, *Bens.*
panthera, *Férus.*
papyracea, *Pfeiff.*
porphyrostoma, *Shuttl.*
prunum, *Reeve.*
purpurea, *Chem.*
reticulata, *Pfeiff.*
rhodostoma, *Phil.*
Rodatzi, *Dkr.*
semidecussata, *Mke.*
semisculpta, *Pfeiff.*
siderata, *Reeve.*
siuistrorsa, *Chem.*
tincta, *Reeve.*
ustulata, *Lam.*
variegata, *F. Colum.*
veruina, *Bens.*
zebra, *Chem.*

Sub-gen. HOMORUS, Albers.

Shell thin, turreted; apex obtuse, whorls numerous; columella rather straight, obliquely truncate.

clavus, *Pfeiff.*
cyanostoma, *Rüpp.*
marmorea, *Reeve.*
paxillus, *Reeve.*
Pfeifferi, *Dkr.*

Sub-gen. CARELIA, H. and A. Adams.

Shell elongately turreted; whorls numerous, flattened; columella strongly arcuated and contorted.

bicolor, *Jay.*
cochlea, *Reeve.*
fuliginea, *Pfeiff.*
Newcombi, *Pfeiff.*
paradoxa, *Pfeiff.*

Genus LIMICOLARIA, Schumacher.

Shell perforate, conically or turreted-oblong, last whorl shorter than the spire; aperture oblong, sub-oval; columella vertical, protracted at the base; peristome simple, thin, straight, the columellar margin dilated, arcuately reflexed.

Syn. Limicolarius, *Beck.*

Ex. L. Kambeul, *Adanson*, pl. 73, fig. 7. Shell, L. flammea, *Müller*, fig. 7, *a*.

This is entirely an African group, inhabiting Senegal, Nubia, Egypt, the Mozambique, and Abyssinia.

Species of Limicolaria.

æquatoria, *Reeve.*
Africana, *Reeve.*
Aurora, *Jay.*
Cailliaudi, *Pfeiff.*
flammea, *Müll.*
flammulata, *Pfeiff.*
Gouldi, *Reeve.*
interstincta, *Gould.*
Kambeul, *Adans.*
Kraussi, *Pfeiff.*
luctuosa, *Pfeiff.*
mucida, *Gould.*
Numidica, *Reeve.*
Pyrrhus, *Albers.*
Reeveana, *Pfeiff.*
rubicundula, *Gould.*
Rüppelliana, *Pfeiff.*
spectralis, *Reeve.*
suffusa, *Reeve.*
suturalis, *Pfeiff.*
tenebrica, *Reeve.*
torrida, *Gould.*
turbinata, *Lea.*
violacea, *Pfeiff.*

Sub-gen. LIPARUS, Albers.

Shell very narrowly perforated, ovately conical; spire rather obtuse; columella straight, dilated and reflexed superiorly.

atomata, *Gray.*
crassilabris, *Gray.*
Favanni, *Lam.*
rhodostoma, *Gray.*

Genus PSEUDACHATINA, Albers.

Shell solid, ovately turreted; whorls 8—9, the last nearly equal to $\frac{1}{3}$ of the length; columella somewhat intorted, arcuately truncate; aperture lunately oval; peristome expanded, the margins joined by a callus.

Ex. P. Downesii, *Gray*, pl. 75, fig. 1.

One species described is from the Island of Fernando Po, on the west coast of Africa, the other is from Old Calabar.

Species of Pseudachatina.

Downesii, *Gray*. Wrightii, *Sow. Jun.*

Genus COLUMNA, Perry.

Shell sinistrorsal or dextral, subulately turreted, decussately granulated; apex obtuse, whorls constricted at the suture, the lower impressed in the middle; aperture elongated, auriform, narrowed posteriorly; columella callous, loosely spirally twisted, forming an open canal along the length of the spire, the base abruptly truncate; peristome simple, straight, acute.

Syn. Acicula, *Blainv.*, not *Risso* or *Hartm.*

Ex. C. flammea, *Martyn*, pl. 74, fig. 1. Shell, C. flammea, fig. 1, *a*.

The typical species of this genus is found in Prince's Island, living among dead leaves in thick Ebony woods; the other species are from California and Prince's Island.

Species of Columna.

eximia, *Shuttl.* flammea, *Martyn.*

Sub-gen. RHODEA, H. and A. Adams.

Shell thin, dextral, clausiliaform; last whorl flattened, the base acutely carinated, excavated beneath; columella arcuated, thickened, sub-truncate.

Californica, *Pfeiff.*

Genus PSEUDOTROCHUS, Klein.

Shell solid, ovately elongated; apex acuminated, whorls 7—8, the last about equal to $\frac{1}{3}$ of the length; columella narrow, distinctly truncated in the adult; aperture lunately oval, sub-angulated; peristome straight, acute, the margins united by an intrant callus.

Syn. Chersina, *Humph.* Liguus, *Montf.*

Ex. C. alabaster, *Rang*, pl. 73, fig. 8. Shell, C. virgineus, *Linnæus*, fig. 8, *a*.

The species of this genus are West Indian, coming from the Islands of Cuba and Haiti.

Species of Pseudotrochus.

alabaster, *Rang.*
balteatus, *Gould.*
Blainianus, *Poey.*
carinatus, *Pfeiff.*
crenatus, *Swains.*
emarginatus, *Swains.*
fasciatus, *Müll.*
lineatus, *Valenc.*
murreus, *Reeve.*
pictus, *Reeve.*
Solimanus, *Morel.*
virgineus, *Linn.*

Genus ACHATINELLA, Swainson.

Shell imperforate, bulimiform; aperture ovate, acute posteriorly; columella strongly toothed at the base or in the middle, sometimes twisted, lamelliform, produced; peristome simple or labiate, margins unequal.

Ex. A. decora, *Férussac*, pl. 74, fig. 2. Shell, A. vulpina, *Férussac*, fig. 2, *a*.

The species of this genus are all from the Pacific Islands, where they live among the foliage of the low bushes, in shady places, especially in the neighbourhood of the sea; they are very numerous in the Sandwich Islands; the females are ovoviviparous, in which respect they resemble *Partula*.

Species of Achatinella.

abbreviata, *Reeve*.
adusta, *Reeve*.
ampla, *Newc*.
bacca, *Reeve*.
bella, *Reeve*.
bilineata, *Reeve*.
Buddii, *Newc*.
casta, *Newc*.
castanea, *Reeve*.
colorata, *Reeve*.
concinna, *Newc*.
conspersa, *Pfeiff*.
crassidentata, *Pfeiff*.
curta, *Newc*.
decora, *Férus*.
Emersoni, *Newc*.
fulgens, *Newc*.
germana, *Newc*.
globosa, *Pfeiff*.
gracilis, *Pfeiff*.
Johnsoni, *Newc*.
lorata, *Férus*.
lugubris, *Chem*.
melanostoma, *Newc*.
Mighelsiana, *Pfeiff*.
napus, *Pfeiff*.
nivosa, *Newc*.
olivacea, *Reeve*.
polita, *Newc*.
producta, *Reeve*.
pulchella, *Pfeiff*.
pulcherrima, *Swains*.
recta, *Newc*.
Reevei, *C. B. Adams*.
rufa, *Newc*.
solitaria, *Newc*.
turgida, *Newc*.
ustulata, *Newc*.
valida, *Pfeiff*.
ventrosa, *Pfeiff*.
venulata, *Newc*.
vulpina, *Férus*.

Sub-gen. AMASTRA, H. and A. Adams.

Shell usually dextral, not striped or banded; apex of spire often mucronate, whorls longitudinally striated or rugose; aperture small; columella with a strong, spiral, lamelliform, anterior plait; outer lip incrassated.

Baldwini, *Newc.*
biplicata, *Newc.*
ellipsoidea, *Gould.*
gigantea, *Newc.*
magna, *C. B. Adams.*
melampoides, *Pfeiff.*
mœsta, *Newc.*
nucleola, *Gould.*
obesa, *Newc.*
obscura, *Newc.*
reticulata, *Newc.*
tristis, *Férus.*
ventulus, *Férus.*
violacea, *Newc.*

Sub-gen. PARTULINA, Pfeiffer.

Shell ovately conical, usually heterospiral; whorls simple; columella tortuous, not truncate anteriorly; outer lip thickened internally; peritreme reflexed.

Gouldi, *Newc.*
grisea, *Newc.*
perdix, *Reeve.*
splendida, *Newc.*
tessellata, *Newc.*
virgulata, *Migh.*

Sub-gen. BULIMELLA, Pfeiffer.

Shell ovately conical, often reversed; whorls smooth; columella short, tortuous, not abruptly truncate anteriorly; outer lip internally marginate; peritreme simple, not reflexed.

attenuata, *Pfeiff.*
bulimoides, *Swains.*
candida, *Pfeiff.*
cestus, *Newc.*
cinerosa, *Pfeiff.*
crassa, *Newc.*
dolium, *Pfeiff.*
Forbesiana, *Pfeiff.*
Fricki, *Pfeiff.*
glabra, *Newc.*
macrostoma, *Pfeiff.*
monacha, *Pfeiff.*
multicolor, *Pfeiff.*
multilineata, *Newc.*

mustelina, *Migh.*
ovata, *Newc.*
planospira, *Pfeiff.*
porcellana, *Newc.*
Redfieldi, *Newc.*
rosea, *Swains.*
rugosa, *Newc.*
semicarinata, *Newc.*
sordida, *Newc.*
Sowerbyana, *Pfeiff.*
Swainsoni, *Pfeiff.*
Swifti, *Migh.*
tæniolata, *Pfeiff.*
Tappaniana, *C. B. Adams.*
terebra, *Newc.*
variabilis, *Newc.*
vidua, *Pfeiff.*
viridans, *Migh.*

Sub-gen. LAMINELLA, Pfeiffer.

Shell conico-turreted; spire attenuated, apex obtuse, whorls smooth, the last ventricose; columella twisted, with a strong, anterior, lamellar plait; outer lip acute, simple.

acuta, *Newc.*
affinis, *Newc.*
albolabris, *Newc.*
assimilis, *Newc.*
brevis, *Pfeiff.*
citrina, *Migh.*
cornea, *Newc.*
crassilabrum, *Newc.*
cylindrica, *Newc.*
flavescens, *Newc.*
fusca, *Newc.*
fusiformis, *Pfeiff.*
gravida, *Férus.*
lineolata, *Newc.*
marmorata, *Gould.*
melanosis, *Newc.*
modesta, *C. B. Adams.*
mucronata, *Newc.*
nubilosa, *Migh.*
obscura, *Newc.*
picta, *Migh.*
porphyrea, *Newc.*
pupoidea, *Newc.*
rubens, *Gould.*
rudis, *Pfeiff.*
sanguinea, *Newc.*
soror, *Newc.*
spirizona, *Férus.*
straminea, *Reeve.*
suffusa, *Reeve.*
textilis, *Férus.*
turritella, *Férus.*
variegata, *Pfeiff.*
venusta, *Migh.*

Sub-gen. NEWCOMBIA, Pfeiffer.

Shell turreted, heterospiral; whorls transversely lirate or rugosely plicate; columella with the truncature indistinct; outer lip simple, acute.

aptycha, *Pfeiff.*
cerealis, *Gould.*

Cumingi, *Newc.*
elongata, *Newc.*
Helena, *Newc.*
Pfeifferi, *Newc.*
physa, *Newc.*
plicata, *Migh.*

Sub-gen. LEPTACHATINA, Gould.

Shell elongated, thin, translucent, shining; spire elevated, obtuse; aperture narrow, one-third the length of the shell, rounded in front, acute behind; columella without a conspicuous fold bordering the truncation.

accincta, *Migh.*
acuminata, *Gould.*
cingula, *Migh.*
clara, *Pfeiff.*
corneola, *Pfeiff.*
fumosa, *Newc.*
grana, *Newc.*
guttula, *Gould.*
nitida, *Newc.*
pyramis, *Pfeiff.*
vitrea, *Newc.*

Sub-gen. LABIELLA, Pfeiffer.

Shell acuminately ovate; apex obtuse; inner lip callous; outer lip inflexed, thickened, with a callosity in the middle of the inner margin

dentata, *Pfeiff.*
labiata, *Newc.*

Sub-gen. AURICULELLA, Pfeiffer.

Shell sub-perforate, oblong-conic; apertural paries furnished with an intrant, spiral lamella; columella with the anterior plait dentiform or obsolete; peritreme a little expanded.

auricula, *Férus.*
cerea, *Pfeiff.*
Petitiana, *Pfeiff.*
pusilla, *Gould.*

Sub-gen. FRICKELLA, Pfeiffer.

Shell sub-perforate, oblong; apertural paries furnished with an intrant, spiral lamella; columellar plait compressed; peritreme simple, straight.

amœna, *Pfeiff.*

Genus TORNATELLINA, Beck.

Shell imperforate, ovate or sub-trochiform; aperture semi-lunar; columella tortuous, truncated; margins unequal, the columellar uni-lamellated, the external plicated within.

Syn. Elasmatina, *Petit.*

Ex. T. bilamellata, *Anton*, pl. 74, fig. 4.

The species of *Tornatellina* vary in their geographical distribution, some being European, and others inhabiting the Island of Opara in the Pacific Ocean, the Island of Juan Fernandez, Lima, and Madeira.

Species of Tornatellina.

bilamellata, *Anton.*
globosa, *Petit.*
Recluziana, *Petit.*
trochiformis, *Beck.*
trochlearis, *Beck.*

Sub-gen. LEPTINARIA, Beck.

Shell ovate, or elongated; outer lip simple.

Antillarum, *Shuttl.*
Antoni, *Pfeiff.*
castanea, *Pfeiff.*
Cernica, *Bens.*
concentrica, *Reeve.*
Cumingiana, *Pfeiff.*
lamellata, *Pot. and Mich.*
lamellosa, *Moric.*

minuta, *Anton.*
Novoseelandica, *Pfeiff.*
opalescens, *Shuttl.*
ovata, *Anton.*
Paroliniana, *Webb and Berth.*
peponum, *Gould.*
Philippii, *Pfeiff.*
stylodon, *Shuttl.*
turrita, *Anton.*
unilamellata, *Férus.*

Sub-fam. BULIMINÆ.

Eye-peduncles and tentacles well-developed; foot elongate, pointed behind.

Shell oblong or ovoid, sometimes conoidal or turreted; aperture longer than wide; columella arcuated, not truncate anteriorly.

Genus COCHLOSTYLA, Férussac.

Shell imperforate, ovately or conically globose; spire more or less conoidal, apex obtuse; aperture oval or lunately rotundate; columella straight, often vertical, dilated, rarely arcuated or excavated; peristome simple, expanded or shortly reflexed.

Syn. Bulina, *Lesson.* Orthostylus, *Beck.*

Ex. C. chloris, *Reeve*, pl. 74, fig. 4. Shell, C. metaformis, *Férussac*, fig. 4, *a*.

The various islands of the Philippine Archipelago harbour the members of this extensive group, many of the species of which are remarkable for the extreme beauty of their shells, and the peculiar hydrophanous nature of the epidermis.

Species of Cochlostyla.

Ægle, *Brod.*
bicolorata, *Lea.*
cunctator, *Reeve.*
Daphnis, *Brod.*
faunus, *Brod.*
gilva, *Sow.*
imperator, *Pfeiff.*
juglans, *Pfeiff.*
leopardus, *Pfeiff.*
leucophæa, *Sow.*
lignaria, *Pfeiff.*
macrostoma, *Pfeiff.*
metaformis, *Férus.*
monozona, *Pfeiff.*
mus, *Brod.*
nimbosa, *Brod.*
pictor, *Brod.*
Pfeifferiana, *Reeve.*
Philippinensis, *Pfeiff.*
pythogaster, *Férus.*
rufogaster, *Reeve.*
solida, *Pfeiff.*
solivaga, *Reeve.*
Ticaonica, *Brod.*
uber, *Pfeiff.*

Sub-gen. HELICOBULINUS, Broderip (Chromocochlea, *Hartm.*).

Shell imperforate, sub-turbinate, last whorl ventricose; spire conoidal, apex obtuse; columella straight; aperture lunato-rotundate; peristome simple, expanded, shortly reflexed.

bembicodes, *Pfeiff.*
colossea, *Pfeiff.*
Reevei, *Brod.*
sarcinosa, *Férus.*
Seckendorffiana, *Pfeiff.*
turbinoides, *Brod.*
turbo, *Pfeiff.*
turgens, *Desh.*
Woodiana, *Lea.*

Sub-gen. PITHOHELIX, Swainson.

Shell imperforate, ovately fusiform, last whorl slightly angulated; spire produced, apex obtuse; aperture ovate-oblong; columella straight; peristome simple, expanded, reflexed.

acuminata, *Sow.*
Boholensis, *Brod.*
Calista, *Brod.*
camelopardalis, *Brod.*
concinna, *Sow.*
dactylus, *Brod.*
Diana, *Brod.*
eburnea, *Reeve.*
fulgetrum, *Brod.*
incompta, *Sow.*

nobilis, *Reeve*.
nympha, *Brod*.
pyramidalis, *Sow*.
satyrus, *Brod*.
Siquijorensis, *Pfeiff*.
ventricosa, *Chem*.

Sub-gen. CANISTRUM, Klein (Amphidromus, *Albers*, Balea, *Blainv*., not *Leach*).

Shell sub-perforate or imperforate, often sinistrorsal, ovately oblong or sub-fusiform; columella straight, dilated, rarely arched or contorted; aperture oblong, rarely lunately-ovate; peristome thickened, more or less expanded.

Adamsii, *Reeve*.
atricallosa, *Gould*.
balanoides, *Jonas*.
brevicula, *Pfeiff*.
chloris, *Reeve*.
contusa, *Reeve*.
crassilabris, *Gray*.
frater, *Férus*.
inversa, *Müll*.
Janus, *Pfeiff*.
Guimarasensis, *Brod*.
lævis, *Müll*.
Luzonica, *Sow*.
maculifera, *Brod*.
monilifera, *Gould*.
partuloides, *Brod*.
perversa, *Linn*.
porcellana, *Mouss*.
pyramidalis, *Sow*.
sinistra, *Müll*.
stabilis, *Sow*.
velata, *Brod*.

Sub-gen. CHRYSALLIS, Albers (Phœnicobius, *Mörch*).

Shell perforate, conical or cylindrically ovate; whorls convex; columella straight, reflexed; aperture oblong or lunately rotund; peristome slightly thickened, widely reflexed.

adusta, *Sow*.
arata, *Sow*.
brachyodon, *Sow*.
chrysalidiformis, *Brod*.
Mindoroensis, *Brod*.
onyx, *Brod*.
oömorpha, *Sow*.

Sub-gen. HAPALUS, Albers.

Shell imperforate, ovate-oblong, very thin, shining, last whorl shorter than the spire; aperture semi-oval; columella callous, bent backwards; peristome simple, acute, the right margin arched forwards.

Grateloupi, *Pfeiff.*

Sub-gen. EUDOXUS, Albers.

Shell imperforate, ovate-oblong or elongately conical; whorls flattened, the last often angulated; columella straight, elongate, generally thin; peristome simple, effusely expanded, rarely thickened.

albina, *Grat.*
Calypso, *Brod.*
cincinniformis, *Sow.*
Cumingi, *Pfeiff.*
Dumonti, *Pfeiff.*
effusa, *Pfeiff.*
Hindsi, *Pfeiff.*
labiozonalis, *Grat.*
modesta, *Sow.*
Romblonensis, *Pfeiff.*
simplex, *Jonas.*
smaragdina, *Reeve.*
subcarinata, *Pfeiff.*
translucens, *Brod.*
ventricosa, *Chem.*
virens, *Pfeiff.*

Sub-gen. PHENGUS, Albers.

Shell thin, hyaline, imperforate, pyramidal; whorls flat, the last angulated; aperture sub-rotund, angled above; columella arched; peristome sub-labiate, the margins nearly parallel, the columella dilated, excavated.

evanescens, *Brod.*

Genus PARTULA, Férussac.

Shell solid, narrowly umbilicated, last whorl scarcely exceeding the spire; aperture oblong-oval; columella subplicated, slightly arcuated; peristome callous, internally expanded, margins connate, united by a thin callus.

Syn. Partulus, *Beck.*

Ex. P. gibba, *Férussac*, pl. 75, fig. 2. Shell, P. faba, *Martyn*, fig. 2, *a*.

The *Partulæ* chiefly inhabit the Pacific Islands, the Marianas, Solomon's, Sandwich, Society, and Friendly Islands; they live on low bushes near the sea; the females produce their young alive.

Species of Partula.

actor, *Albers.*
amabilis, *Pfeiff.*
Carteriensis, *Quoy.*
compressa, *Pfeiff.*
conica, *Gould.*
decussata, *Pfeiff.*
dentifera, *Pfeiff.*
diminuta, *C. B. Adams.*
faba, *Martyn.*
filosa, *Pfeiff.*
fragilis, *Férus.*
gibba, *Férus.*
glutinosa, *Pfeiff.*
gonochila, *Pfeiff.*
grisea, *Less.*
Guamensis, *Pfeiff.*
Hebe, *Pfeiff.*
hyalina *Brod.*
inflata, *Reeve.*
Isabellina, *Pfeiff.*
lineata, *Less.*
lutea, *Less.*
major, *Desh.*
micans, *Pfeiff.*
Navagatoria, *Pfeiff.*
Newcombi, *Pfeiff.*
nodosa, *Pfeiff.*
Otaheitana *Brug.*
radiolata, *Pfeiff.*
Recluziana, *Petit.*
Reeveana, *Pfeiff.*
rubescens, *Reeve.*
rufa, *Less.*
Salomonis, *Pfeiff.*
solidula, *Reeve.*
spadicea, *Reeve.*
tæniata, *Mörch.*
Vanikorensis, *Quoy.*
varia, *Brod.*
zebrina, *Gould.*

Genus BULIMUS, Scopoli.

Shell solid, sub-imperforate, or with the perforation covered, ovate or ovately oblong, last whorl ventricose, equalling the spire; aperture oblong-oval; columella rather straight, rarely plicate; peristome thick, expanded, reflexed and sometimes adnate, the margins joined by a callus, the columellar dilated, reflexed.

Ex. B. oblongus, *Müller*, pl. 74, fig. 5. Shell, B. oblongus, fig. 5, *a*.

The geographical distribution of the species of *Bulimus* proper is tropical America, where they are extensively diffused north and south of the equator. The species of the subordinate group, *Plecocheilus*, inhabit the islands of the Caribbean Sea, Brazil, Venezuela, St. Vincent, and Porto Caballo; those of *Auris* inhabit the forests of Brazil, along the coast, and the province of Bahia.

Species of Bulimus.

adoptus, *Reeve*.
astrapoides, *Jonas*.
auritus, *Sow*.
Browni, *Pfeiff*.
Cantagallanus, *Rang*.
crenulatus, *Pfeiff*.
Funcki, *Nyst*.
Gibbonius, *Lea*.
granulosus, *Rang*.
Guerini, *Pfeiff*.
lacunosus, *D'Orb*.
Lamarckianus, *Pfeiff*.
lutescens, *King*.
marmoratus, *Dkr*.
Mathewsii, *D'Orb*.
maximus, *Sow*.
melanocheilus, *Nyst*.
nucleus, *Sow*.
oblongus, *Müll*.
ovum, *Brug*.
pachycheilus, *Pfeiff*.
pardalis, *Férus*.
Popelairianus, *Nyst*.
proximus, *Sow*.
rosaceus, *King*.
Sancta Cruzii, *D'Orb*.
Valenciennesii, *Pfeiff*.

Sub-gen. STROPHOCHEILUS, Spix (Coniclus, *Albers*).

Shell narrowly perforate, ovately-oblong, last whorl obliquely descending; aperture oval or somewhat auriform; columella plicate above; peristome widely expanded, shortly reflexed, the columellar dilated, reflexed.

cardinalis, *Pfeiff.*
contortuplicatus, *Reeve.*
Milleri, *Sow.*
perplexus, *Sow.*
planidens, *Mich.*
pudicus, *Müll.*
rhodocheilus, *Pfeiff.*
unidentatus, *Sow.*

Sub-gen. PLECOCHEILUS, Guilding (Carychium, *Leach*, not *Müll.* Auricula, *Swains.*, not *Lam.* Caprella, *Guild.*, not *Lam.*).

Shell solid, rimate, ovato-fusiform; aperture narrow, elongate, more or less angulated anteriorly; columella with a strong plait; peristome thickened, widely expanded, the right margin undulated.

auris-Sileni, *Born.*
Dillwynianus, *Pfeiff.*
distortus, *Brug.*
euryomphalus, *Jonas.*
perdix, *Pfeiff.*
signatus, *Spix.*
sinuatus, *Albers.*
undulatus, *Mart.*

Sub-gen. CHARIS, Albers.

Shell perforate, oblong, diaphanous; spire short, conical, last whorl exceeding the spire; aperture oblong, auriform; columella tortuous, callous, forming a triangular tooth; peristome expanded.

Blainvillianus, *Pfeiff.*
Founaki, *Homb. and Jacq.*
fulguratus, *Jay.*
fulminans, *Nyst.*
Lovéni, *Pfeiff.*
malleatus, *Jay.*
roseus, *Gould.*

Sub-gen. EURYTUS, Albers.

Shell imperforate, thin, oblong-ovate, last whorl a little exceeding the spire; aperture large, oblong-oval; columella arcuated; peristome shortly expanded, sub-reflexed.

bicolor, *Pfeiff.*
Cathcartiæ, *Reeve.*
elæodes, *Pfeiff.*
floccosus, *Spix.*
galericulum, *Mouss.*
glandiformis, *Lea.*
onça, *D'Orb.*
pintadanus, *D'Orb.*
piperitus, *Sow.*
pulicarius, *Reeve.*
quadricolor, *Pfeiff.*
roseatus, *Reeve.*
succinoides, *Petit.*
sytodes, *Pfeiff.*
Taylorianus, *Reeve.*
Veranyi, *Pfeiff.*
Yungasensis, *D'Orb.*

Sub-gen. BORUS, Albers.

Shell ovately conoidal, solid, rugosely striated, epidermis deciduous or wanting, whorls with coloured spots, the last ventricose; columella rather straight, tortuous above; peristome thickened, shortly reflexed, flexuous.

Adamsonii, *Gray.*
bifulguratus, *Reeve.*
coloratus, *Nyst.*
Crichtoni, *Brod.*
Dennisoni, *Reeve.*
Fris, *Pfeiff.*
iostoma, *Sow.*
irroratus, *Reeve.*
Kellettii, *Reeve.*
labeo, *Brod.*
Maranonensis, *Albers*
Shuttleworthii, *Albers.*
victor, *Pfeiff.*
Yatesi, *Pfeiff.*

Sub-gen. ORPHNUS, Albers.

Shell imperforate, solid, ovately elongate, suture marginate below; columella generally tortuously plicate; peristome thickened, straight.

Achilles, *Pfeiff.*
Hartwegii, *Pfeiff.*
Inca, *D'Orb.*
indutus, *Mke.*

magnificus, *Gratel.*
mahogani, *Sow.*
Largillierti, *Phil.*
loxostomus, *Pfeiff.*
tæniolus, *Nyst.*
Taunaisii, *Férus.*
Thompsoni, *Pfeiff.*

Sub-gen. AURIS, Spix (Pachyotus, *Beck*, Chilonopsis, *Fisch.*).

Shell perforate, ovate; apex acute, the upper whorls often plicate at the sutures; aperture auriform; columella tortuous; peristome widely expanded, reflexed.

Illheocola, *Moric.*
Maximiliana, *Férus.*
melanostoma, *Swains.*
Swainsoni, *Pfeiff.*
vulpina, *Chem.*

Genus OTOSTOMUS, Beck.

Shell rimately perforate, ovately pyramidal or obliquely conical, last whorl keeled or angulated at the base; aperture more or less vertical; columella plicate: peristome simple, widely expanded, reflexed.

Syn. Stenostoma, *Spix*, not *Latr.* Navicula, *Spix*, not *Bory* or *Quoy.*

Ex. O. hygrohylæus, *D'Orbigny*, pl. 74, fig. 6. Shell, O. auris-leporis, *Bruguière*, fig. 6, *a.*

The species of this extensive group are South-American, inhabiting the forests of Bolivia, New Granada, Brazil, Bahia, and Venezuela; the species of *Aspastus* are from Solomon's Island.

Species of Otostomus.

auris-leporis, *Brug.*
auris-muris, *Moric.*
bivittatus, *Sow.*
coarctatus, *Pfeiff.*
flexilabris, *Pfeiff.*
lateralis, *Mke.*
navicula, *Wagn.*
obliquus, *Reeve.*

Sub-gen. ANTHINUS, Albers.

Shell rimately perforate, oblong-conical; spire sub-turreted, last whorl equalling the spire; aperture oval-oblong, within brownish violet; columella dentato-plicate or somewhat constricted; peristome widely expanded, the columellar margin dilated, patent.

Miersii, *Sow.*
multicolor, *Rang.*
pallidior, *Sow.*

Sub-gen. HAMADRYAS, Albers.

Shell with the perforation covered, conical, elongated, thin, diaphanous, shining, slightly strigillate under the lens, last whorl somewhat inflated; aperture ample, oblong-oval; columella dilated, contorted; peristome thin, widely expanded, columellar margin reflexed, appressed.

Baranguillanus, *Pfeiff.*
Bourcieri, *Pfeiff.*
Chimborascensis, *Reeve.*
Curianensis, *Pfeiff.*
fallax, *Pfeiff.*
feriatus, *Reeve.*
flexuosus, *Pfeiff.*
fucatus, *Reeve.*
fusoides, *D'Orb.*
geometricus, *Pfeiff.*
glaucostoma, *Albers.*
Knorri, *Pfeiff.*
lætus, *Reeve.*
lilacinus, *Reeve.*
linostoma, *D'Orb.*
Lobbii, *Reeve.*
Pealianus, *Lea.*
pervariabilis, *Pfeiff.*
strigatus, *Sow.*
zoographicus, *D'Orb.*

Sub-gen. DRYMÆUS, Albers.

Shell perforate or umbilicated, oblong-acuminate, rugosely striated; spire elongated; aperture oblong-oval; columella somewhat tortuous, a little receding; peristome simple, the right margin shortly, the basal widely expanded, the columellar reflexed, patent.

aquilis, *Reeve.*
cerussatus, *Reeve.*

Deshayesii, *Pfeiff.*
hygrohylæus, *D'Orb.*
marmarinus, *D'Orb.*
prætextus, *Reeve.*
subinterruptus, *Pfeiff.*
xanthostoma, *D'Orb.*

Sub-gen. LEIOSTRACUS, Albers.

Shell thin, perforate, oblong-conical, glabrous, very often shining, pellucid, last whorl shorter than the spire; peristome thin, more or less expanded, the columellar margin dilated, reflexed.

angulosus, *Beck.*
auratus, *Pfeiff.*
castus, *Pfeiff.*
cinnamomeo-lineatus, *Moric.*
Gruneri, *Pfeiff.*
Jonasi, *Pfeiff.*
Manoeli, *Moric.*
Mexicanus, *Lam.*
multifasciatus, *Lam.*
onager, *Beck.*
Pateli, *Albers.*
tribalteatus, *Reeve.*
vimineus, *Moric.*
Vincentinus, *Pfeiff.*
vittatus, *Spix.*
Ziegleri, *Pfeiff.*

Sub-gen. GONIOSTOMUS, Beck.

Shell rimately-perforate, fusiform, or oblong-conical; spire elongate, last whorl attenuated at the base; aperture oblong, more or less channelled anteriorly; columella arcuate, sub-plicate; peristome expanded, shortly reflexed.

angulatus, *Wagn.*
Capueira, *Spix.*
egregius, *Pfeiff.*
fusiformis, *Rang.*
goniostoma, *Férus.*
Lattrei, *Pfeiff.*

Sub-gen. ASPASTUS, Albers.

Shell perforate, fusiform, thin, sub-diaphanous, sulcato-striate, last whorl larger than the spire; aperture ovate-oblong, rounded anteriorly; columella sub-arcuate; peristome marginate, shortly reflexed, the margins approximate, united by a thin callus.

Cleryi, *Petit.*
miltocheilus, *Reeve.*

Genus ODONTOSTOMUS, Beck.

Shell rimately perforate, cylindrically fusiform; spire elongate, turreted, last whorl shorter than the spire, compressed at the base, often externally scrobiculate; aperture oblong, contracted, with from 3—6 teeth, apertural paries furnished with an intrant lamella; peristome expanded, reflexed, the margins approximate, joined by a thin callus.

Syn. Clausilia, *Spix*, not *Lam.* Cyclodontina, *Beck.* Macrodontes, *Swains.*

Ex. O. Pantagruelinus, *Moricand*, pl. 75, fig. 3. Shell, O. Gargantua, *Férussac*, fig. 3, *a*.

The species of this group inhabit the forests of Brazil, especially those of Bahia.

Species of Odontostomus.

Bahicola, *Mörch.*
Bahiensis, *Moric.*
Charpentieri, *Gratel.*
costatus, *Pfeiff.*
dædaleus, *Desh.*
exesus, *Spix.*
fuscagula, *Lea.*
Gargantua, *Férus.*
Grayanus, *Pfeiff.*
Hilarii, *Gray.*
Janeirensis, *Sow.*
juvencus, *Mörch.*
leucotrema, *Beck.*
occultus, *Rceve.*
Pantagruelinus, *Moric.*
punctatissimus, *Less.*
pupoides, *Spix.*
quinquedentatus, *Mühlf.*
rhodostoma, *D'Orb.*
ringens, *Dkr.*
sectilabris, *Pfeiff.*
sexdentatus, *Spix.*
vermiculatus, *Mke.*
Wagneri, *Pfeiff.*

Genus TOMIGERUS, Spix.

Shell horizontally umbilicated, globosely conical, compressed, scalariform; aperture vertical, ringent.

Ex. T. clausus, *Spix*, pl. 75, fig. 4.

Tomigerus resembles a depressed *Odontostomus;* the shells also remind one of *Pythia* and *Anostoma.* The species inhabit the province of Bahia in Brazil, and are doubtless only a modification of the *Odontostomi,* which come from a similar locality.

Species of Tomigerus.

clausus, *Spix.*
Cumingi, *Newc.*
dentatus, *Wood.*
gibberulus, *Burrow.*
turbinatus, *Pfeiff.*

Genus PLACOSTYLUS, Beck.

Shell imperforate, oblong-conic, rugosely striated, last whorl a little shorter than the spire; aperture oblong-oval or irregular; columella tortuous, arcuately plicate; peristome thick, reflexly expanded, the margins united by a shining tuberculated callus, the columellar dilated, appressed.

Ex. P. fibratus, *Martyn*, pl. 75, fig. 5.

The species of this group inhabit the Australian islands, New Caledonia, and New Holland.

Species of Placostylus.

ascendens, *Pfeiff.*
auris-bovina, *Chem.*
Caledonicus, *Petit.*
fibratus, *Martyn.*
fuligineus, *Pfeiff.*
porphyrostomus, *Pfeiff.*
Shongi, *Less.*

Sub-gen. CARYODES, Albers.

Shell solid, imperforate, oblong-ovate; whorls plicate at the suture, the last equalling the spire; columella rather straight; peristome simple, obtuse.

Baconi, *Bens.* Dufresnii, *Leach.*

Genus ORTHALICUS, Beck.

Shell imperforate, ovately conical; spire rather obtuse, last whorl shorter than the spire; aperture oval; columella somewhat thickened, rather involute; peristome simple, the margins joined by a deeply-intrant callus.

Syn. Oxystyla, *Schlütt.*

Ex. O. zebra, *Müller*, pl. 75, fig. 6. Shell, O. zebra, fig. 6, *a*.

The species of *Orthalicus* inhabit the Antilles, the whole of Brazil, Columbia, and the north of Peru. The sub-genus *Corona* is principally found in Peru and Central America, where they live in the centre of the great forests; Chili, Peru, Bolivia, Guiana, and Brazil are the localities of the group *Plectostylus;* the species of *Leptomerus* are from Central America, the Antilles, Brazil, and Mexico. *Rabdotus* is a Chilian and Peruvian group, living principally in the forests of the mountain ranges.

Species of Orthalicus.

Bensoni, *Reeve.*
crystallinus, *Reeve.*
gallina-sultana, *Chem.*
monodon, *C. B. Adams.*
pavoninus, *Spix.*
phlogerus, *D'Orb.*
pulchellus, *Spix.*
zebra, *Müll.*

Sub-gen. CORONA, Albers.

Shell usually sinistrorsal, ovately-oblong; spire elongated, apex obtuse; columella contorto-plicate, callous above, slender and obsoletely truncated at the base; outer lip simple, acute.

auripigmentum, *Reeve.*
flammigerus, *Férus.*
Kercadonis, *Gratel.*
Moreletianus, *Desh.*
Powisianus, *Petit.*
regina, *Férus.*
Saulcydi, *Joann.*
tenuis, *Gray.*

Sub-gen. PLECTOSTYLUS, *Beck.*

Shell thin, pellucid, imperforate, ovate-oblong, or ovately conical; spire acute; columella filiform, straight, receding above; peristome thin, acute.

affinis, *Brod.*
Broderipii, *Sow.*
Buschii, *Pfeiff.*
Chilensis, *Less.*
Coquimbensis, *Sow.*
coturnix, *Sow.*
elegans, *Pfeiff.*
harpa, *Jay.*
hilarus, *Pfeiff.*
lynciculus, *Dev. and Hüpp.*
meleagris, *Pfeiff.*
nigrolimbatus, *Pfeiff.*
Peruvianus, *Brug.*
pessulatus, *Reeve.*
plectostylus, *Pfeiff.*
punctulifer, *Sow.*
reflexus, *Pfeiff.*
simulus, *Morel.*
variegatus, *Pfeiff.*

Sub-gen. OXYCHEILUS, Albers.

Shell thin, pellucid, shining, rather imperforate, somewhat fusiform; spire acute; columella nearly straight, slender; peristome simple, straight.

Hanleyi, *Pfeiff.*
Recluziana, *Pfeiff.*
Requieni, *Pfeiff.*

Sub-gen. LEPTOMERUS, Albers.

Shell thin, rimately perforate, oblong-conical; whorls rather flat, the last shorter than the spire; columella sub-arcuated; peristome thin, simple, acute.

alternans, *Beck.*
bilineatus, *Sow.*
Boissieri, *Moric.*
chrysalis, *Pfeiff.*
citrino-vitreus, *Moric.*
constrictus, *Pfeiff.*
corneus, *Sow.*
coronatus, *Pfeiff.*
debilis, *Beck.*
demotus, *Reeve.*
Dysoni, *Férus.*
electrum, *Reeve.*
erectus, *Reeve.*
exilis, *Gmel.*
fidusus, *Reeve.*
fraterculus, *Férus.*
fulvicans, *Pfeiff.*
Goudoti, *Petit.*
Granadensis, *Pfeiff.*
guttula, *Pfeiff.*
Helenæ, *Quoy.*
heloicus, *D'Orb.*
Hondurasanus, *Pfeiff.*
inflatus, *Lam.*
Kingii, *Gray.*
limnoides, *Férus.*
lineatus, *Spix.*
lividus, *Reeve.*
lucidus, *Reeve.*
maculatus, *Lea.*
melo, *Quoy.*
Meridanus, *Pfeiff.*
nigrofasciatus, *Pfeiff.*
pallidior, *Sow.*
Panamensis, *Brod.*
physodes, *Mke.*
primula, *Reeve.*
pseudo-succineus, *Moric.*
pubescens, *Moric.*
puellaris, *Reeve.*
sarcodes, *Pfeiff.*
Sowerbyi, *Pfeiff.*
spadiceus, *Mke.*
Studeri, *Pfeiff.*
tenuis, *Dkr.*
tenuissimus, *Férus.*
translucens, *Brod.*
transparens, *Reeve.*
trichodes, *D'Orb.*
umbraticus, *Reeve.*
unicolor, *Sow.*
velutinus, *Pfeiff.*
venosus, *Reeve.*

Sub-gen. MESEMBRINUS, Albers.

Shell rimately perforate, ovately conical, rough or longitudinally striated; apex of spire acute, last whorl shorter than

the spire; columella somewhat tortuous; peristome straight, simple.

æquatorius, *Reeve.*
alto-Peruvianus, *Reeve.*
ambustus, *Reeve.*
andicola, *Pfeiff.*
apodemetes, *D'Orb.*
Assumptionis, *Val.*
Bengalensis, *Lam.*
bicolor, *Sow.*
Boithyanus, *Pfeiff.*
Bolivianus, *Pfeiff.*
Californicus, *Reeve.*
caliginosus, *Reeve.*
canaliculatus, *Pfeiff.*
Catlowæ, *Reeve.*
confusus, *Reeve.*
Cotopaxiensis, *Pfeiff.*
Cuzcoensis, *Reeve.*
decussatus, *Reeve.*
delumbis, *Reeve.*
depictus, *Reeve.*
depstus, *Reeve.*
discrepans, *Sow.*
Draparnaudi, *Pfeiff.*
dubius, *Pfeiff.*
Dunkeri, *Pfeiff.*
effeminatus, *Reeve.*
exornatus, *Reeve.*
fabrefactus, *Reeve.*
fenestratus, *Pfeiff.*
Hegewischi, *Pfeiff.*
Hennahi, *Gray.*
lactarius, *Mke.*
lemniscatus, *Reeve.*
liliaceus, *Férus.*
Liebmanni, *Pfeiff.*
litus, *Férus.*
livescens, *Pfeiff.*
Loxensis, *Pfeiff.*
manupictus, *Reeve.*
Menkei, *Gruner.*
modestus, *Brod.*
Montagnei, *D'Orb.*
Montevidensis, *Pfeiff.*
muliebris, *Reeve.*
myristicus, *Reeve.*
nitidus, *Brod.*
nucinus, *Reeve.*
nugristicus, *Reeve.*
Nystianus, *Pfeiff.*
Oreades, *D'Orb.*
pæcilus, *D'Orb.*
papyraceus, *Mawe.*
Pazianus, *D'Orb.*
primularis, *Reeve.*
pulchellus, *Brod.*
Quitensis, *Pfeiff.*
rubellus, *Brod.*
rudis, *Anton.*
Sachsei, *Albers.*
Schiedeanus, *Pfeiff.*
scitulus, *Reeve.*
sporadicus, *D'Orb.*
subfasciatus, *Pfeiff.*
sulcosus, *Pfeiff.*
tigris, *Brod.*
Torallyi, *D'Orb.*
tumidulus, *Pfeiff.*
vexillum, *Wood.*
zonulatus, *Pfeiff.*

Sub-gen. SCUTALUS, Albers.

Shell perforate or umbilicated, ovately conic, granulately striated, sometimes sprinkled with hairs, last whorl ventricose, more or less equalling the spire, compressed next the umbilicus; peristome expanded, often reflexed, slightly thickened internally.

abyssorum, *D'Orb.*
alutaceus, *Reeve.*
bifasciatus, *Phil.*
brephoides, *D'Orb.*
Bridgesi, *Pfeiff.*
castaneus, *Pfeiff.*
Cora, *D'Orb.*
crenulatus, *Pfeiff.*
culmineus, *D'Orb.*
derelictus, *Brod.*
foveolatus, *Reeve.*
heterotrichus, *Moric.*
Jussieui, *Valenc.*
lithoicus, *D'Orb.*
lutescens, *King.*
Mariæ, *Albers.*
miles, *Pfeiff.*
mutabilis, *Brod.*
Petiti, *Pfeiff.*
porphyreus, *Pfeiff.*
Proteus, *Brod.*
purpuratus, *Reeve.*
Schmidti, *Pfeiff.*
scolimatus, *Wood.*
sordidus, *Less.*
tessellatus, *Shuttl.*
thamnoicus, *D'Orb.*
Tupaicii, *D'Orb.*
velutino-hispidus, *Moric.*
versicolor, *Brod.*

Sub-gen. RABDOTUS, Albers.

Shell perforate or rimate, rather solid, ovately convex or acuminated; spire with the apex corneous, last whorl attenuated at the base; columella rather straight; peristome simple, acute, columellar margin, above the perforation, dilated, free.

albicans, *Brod.*
albus, *Sow.*
badius, *Sow.*
coagulatus, *Reeve.*
conspersus, *Sow.*
dealbatus, *Jay.*
decoloratus, *Sow.*
Denekei, *Gray.*
durus, *Spix.*
erosus, *Brod.*
erythrostomus, *Jay.*
ferrugineus, *Reeve.*
guttatus, *Brod.*
Huascensis, *Reeve.*

Laurentii, *Sow.*
lichenum, *D'Orb.*
Limensis, *Reeve.*
Orbignyi, *Pfeiff.*
Pericanus, *Albers.*
Philippii, *Pfeiff.*
pruinosus, *Sow.*
pulverulentus, *Pfeiff.*
pustulosus, *Brod.*
rhodacme, *Pfeiff.*
scabiosus, *Sow.*
scalariformis, *Brod.*
scutulatus, *Brod.*
striatus, *King.*

Genus BULIMULUS, Leach.

Shell solid, rimately perforated, oblong-conic or fusiformly cylindrical; apex horny, rather obtuse, last whorl shorter than the spire; aperture small, obliquely oval; peristome straight, labiate within, simple, or with teeth, right margin rather expanded, the columellar reflexed and patulous.

Syn. Zebrina, *Held.* Peristoma, *Kryn.*

Ex. B. montanus, *Draparnaud,* pl. 75, fig. 7. Shell, B. detritus, *Müller,* fig. 7, *a.*

This group, as restricted, is European in its geographical distribution, being chiefly found along the shores and among the islands of the Mediterranean. The species of *Rachis,* however, are found in Africa. The species of *Ena* are European with a few exceptions; the *Napæus* group inhabit the Canary Islands, Tenerife, and Gomara; those of *Omphalostyla* are confined to the islands of the Gallapagos Archipelago; *Ataxus* is from Cobija and Bolivia; while the species of *Petræus* are entirely African in their geographical range.

Species of Bulimulus.

Alepi, *Férus.*
Apenninus, *Jan.*
candelaris, *Pfeiff.*
Cosensis, *Reeve.*
Cretensis, *Pfeiff.*
cymatilis, *Reeve.*

Dardanus, *Friv.*
detritus, *Müll.*
eburneus, *Pfeiff.*
fasciolatus, *Oliv.*
gibber, *Kryn.*
Hohenackeri, *Kryn.*
illibatus, *Ziegl.*
Keppelli, *Pfeiff.*
Spratti, *Pfeiff.*
Tauricus, *Lange.*
Varnensis, *Friv.*

Sub-gen. BREPHULUS, Beck.

Aperture with the peristome dentate within.

bidens, *Kryn.*
compactus, *Friv.*
spoliatus, *Parr.*
subulatus, *Rossm.*
Tournefortianus, *Férus.*
zebriolus, *Férus.*

Sub-gen. RACHIS, Albers.

Shell perforate, turreted, conical or ovate; spire acuminate, last whorl often angulated in the middle; peristome simple, acute, the columellar margin dilated, reflexed.

albatus, *Férus.*
Benguelensis, *Pfeiff.*
connivens, *Pfeiff.*
Férussaci, *Dkr.*
Guinensis, *Jonas.*
Mozambicensis, *Pfeiff.*
pallens, *Jonas.*
Socotorensis, *Férus.*

Sub-gen. ENA, Leach (Merdigera, *Held.* Merdigerus, *Albers*).

Shell rimate, ovately oblong, or cylindrical; peristome patent, internally labiate, the right margin expanded, the columellar shortly dilated, patent.

arcuatus, *Pfeiff.*
cœlebs, *Bens.*
cœnopictus, *Bens.*
Frivaldskyi, *Pfeiff.*
gregarius, *Adams and Reeve.*
Kunawurensis, *Hutt.*
Martinicensis, *Pfeiff.*
Meiacoshimensis, *Adams and Reeve.*
Merduenianus, *Kryn.*
montanus, *Drap.*
Nilagiricus, *Pfeiff.*

obscurus, *Müll.*
pretiosus, *Cantr.*
rufistrigatus, *Bens.*
rupestris, *Phil.*
subtilis, *Rossm.*
vibex, *Hutt.*

Sub-gen. OMPHALOSTYLA, *Schlütter* (Næsiotus, *Albers*).

Shell somewhat widely perforate, ovately conical, or turreted-oblong, rugulosely striated; columella vertical; aperture somewhat angulated at the base; peristome acute, internally sub-labiate.

achatinellus, *Forbes.*
chemnitzoides, *Forbes.*
clavus, *Sow.*
corneus, *Sow.*
Darwinii, *Pfeiff.*
eschariferus, *Sow.*
incrassatus, *Pfeiff.*
Jacobi, *Sow.*
nucula, *Pfeiff.*
nux, *Brod.*
rugiferus, *Sow.*
rugulosus, *Sow.*
sculpturatus, *Pfeiff.*
unifasciatus, *Sow.*
ustulatus, *Brod.*

Sub-gen. ATAXUS, Albers.

Shell umbilicated, umbilicus very wide, pervious as far as the apex, ovately conical; last whorl strongly compressed, angulated at the base; aperture narrowed, oblong, sub-angulated at the base; peristome simple

infundibulum, *Pfeiff.*
perspectivus, *Pfeiff.*
umbilicaris, *Soul.*

Sub-gen. NAPÆUS, Albers.

Shell perforate, ovate-oblong, irregularly striated; aperture rotundately oval; peristome acute, expanded, internally labiate, the margins joined by a tuberculated callus.

badiosus, *Férus.*
beticatus, *Férus.*
Bertheloti, *Pfeiff.*
cyaneus, *Albers.*

helvolus, *Webb and Berth.*
lardeus, *Pfeiff.*
nanodes, *Shuttl.*
obesatus, *Webb and Berth.*
Olivieri, *Reeve.*
propinquus, *Shuttl.*
roccellicola, *Webb and Berth.*
tabidus, *Shuttl.*
variatus, *Webb and Berth.*

Sub-gen. PETRÆUS, Albers.

Shell rimate, oblong-conical, or cylindrically oblong; columella plicate; peristome widely expanded, sometimes rather reflexed, margins approximate, generally united by a callus.

Abyssinicus, *Rüpp.*
Arabicus, *Forsk.*
carneus, *Pfeiff.*
fragosus, *Férus.*
fulvicans, *Pfeiff.*
Halepensis, *Pfeiff.*
Jordani, *Boiss.*
labiosus, *Müll.*
labrosus, *Oliv.*
latireflexus, *Reeve.*
Lycicus, *Pfeiff.*
Sidoniensis, *Férus.*
Syriacus, *Pfeiff.*

Genus COCHLICELLA, Férussac.

Shell narrowly perforate, conical, or conico-turreted; whorls 6—9, the last carinated or obsoletely angulated, shorter than the spire; aperture rotundately oval; peristome simple, acute, with the margins contiguous.

Syn. Elisma, *Leach.* Cochlicellus, *Beck.* Longæva, *Mühlfeldt.* Turbulima, *Schlütt.*

Ex. C. cylindrica, *Gray*, pl. 75, fig. 8. Shell, C. acuta, *Müller*, fig. 8, *a*.

The species are found on the shores of the Mediterranean, both in Europe and Africa, and one is found on the west coast of England, and in the Azores and Canary Islands.

Species of Cochlicella.

acuta, *Müll.*
conoidea, *Drap.*
turricula, *Chem.*
ventricosa, *Férus.*

Sub-gen. MACROCERAMUS, Guilding (Leptospira, *Swains.* Pineria, *Poey.* Colobus, *Albers*).

Shell rimate, ovately or cylindrically turreted, last whorl obsoletely-carinated or angulated; aperture sub-circular; peristome thin, patent, the margins contiguous, the right expanded, the columellar dilated, reflexed.

Antillarum, *Gould.*
Beathiana, *Poey.*
concisa, *Morel.*
cylindrica, *Gray.*
cyrtopleura, *Pfeiff.*
formosa, *Gray.*
Gossei, *Pfeiff.*
Guildingii, *Petit.*
Gundlachi, *Pfeiff.*
Hermanni, *Pfeiff.*
Hydeana, *C. B. Adams.*
Kieneri, *Pfeiff.*
Ludovici, *Pfeiff.*
lineata, *Brug.*
microdon, *Pfeiff.*
pupiformis, *Férus.*
Richardi, *Petit.*
signata, *Guild.*
tenuiplicata, *Pfeiff.*
terebra, *Poey.*
turricula, *Pfeiff.*
unicarinata, *Lam.*

Sub-gen. PYRGUS, Albers.

Shell rimate, turreted, whorls flat; aperture angulated at the base; columella straight; peristome thin, straight, columellar margin shortly reflexed above.

turrita, *Brod.*

Genus CHONDRUS, Cuvier.

Shell rimate-ovate, oblong; apex acuminated, whorls 7—9, the last nearly equal to ⅓ of the length; aperture semi-oval, internally generally contracted; peristome labiate, or furnished with numerous teeth, or, very rarely, simple, sometimes the apertural paries is uni-dentate at the external angle.

Syn. Gonodon, *Held.* Chondrula, *Beck.* Jaminia, *Leach.*

Ex. C. pupa, *Linnæus*, pl. 75, fig. 9.

Middle and Southern Europe, and the shores of the Mediterranean and its islands, constitute the chief localities of this genus.

Species of Chondrus.

acus, *Pfeiff.*
Bergeri, *Roth.*
denticulatus, *Pfeiff.*
Eleoicus, *Reeve.*
Lawii, *Phil.*
leucodon, *Pfeiff.*
microtragus, *Parr.*
olivaceus, *Pfeiff.*
Parreysii, *Pfeiff.*
pupa, *Linn.*
quadridens, *Müll.*
quinquedentatus, *Mühlf.*
Rossmässleri, *Pfeiff.*
seductilus, *Ziegl.*
septemdentatus, *Roth.*
tridens, *Müll.*

Sub-gen. MASTUS, Beck (Cylindrus *Fitz.*, not *Breyn.* or *Boanni*).

Shell sub-perforate, cylindrical; apex obtuse, whorls numerous; columella short, straight; peristome internally labiate, a little expanded.

Adenensis, *Pfeiff.*
Burchelli, *Gray.*
Caraccasensis, *Reeve.*
granum, *Pfeiff.*

insularis, *Ehrenb.*
obtusus, *Drap.*
polygyratus, *Reeve.*
scutilus, *Migh.*
trochalus, *Pfeiff.*
Tschudii, *Trosch.*

Sub-gen. MIRUS, Albers.

Shell rimately perforate, sub-cylindrical, thin, pellucid, last whorl anteriorly somewhat ascending; columella arcuated; peristome expanded, internally callous, the margins joined by a rather thick, dentated callus.

Cantori, *Phil.*

Sub-gen. PERONŒUS, Albers.

Shell rimate or perforate, oblong-turreted, or subulate; whorls convex; columella receding or obsoletely arcuated; peristome simple, shortly expanded, the columellar dilated, patent.

Montagnei, *D'Orb.*
montivagus, *D'Orb.*
nanus, *Reeve.*
neglectus, *Pfeiff.*
Pazianus, *D'Orb.*
pupiformis, *Brod.*
scabiosus, *Sow.*
terebralis, *Pfeiff.*
trichodes, *D'Orb.*

Genus BOSTRYX, Troschel.

Shell turreted, the upper whorls regularly united, the last two unrolled, free, bi-carinated; aperture sub-quadrate, with the angles rounded; peristome simple, straight, continuous.

Ex. B. solutus, *Troschel*, pl. 75, fig. 10.

The genus *Bostryx* was founded by Troschel on a remarkable shell brought from Peru by Dr. Tschudi; the last whorls are partly unrolled, and the peritreme is continuous.

Species of Bostryx.

holostoma, *Pfeiff.* solutus, *Trosch.*
rupestris, *Phil.*

Sub-fam. PUPINÆ.

Tentacles rudimentary, minute, or entirely wanting. Foot short, obtuse, or pointed behind.

Shell cylindrical or fusiform; whorls numerous, narrow, equal; aperture small, frequently with elongated teeth or thin laminæ; peristome generally non-continuous.

Genus GIBBUS, Montfort.

Shell deeply rimate, cylindrical, ovate-cylindrical, or compresso-triangular, oblique, closely striated or ribbed, last whorl anteriorly ascending, compressed and sometimes gibbous at the base; aperture lunately oblong, or sub-tetragonal; columella rather straight, often plicate; peristome expanded, shortly reflexed, the margins joined by a thin callus.

Syn. Gibbulina, *Beck.* Gonidomus, *Swains.* Plicadomus, *Swains.* Gonospira, *Swains.* Ptychotrema, *Mörch.*

Ex. G. Lyonetianus, *Pallas*, pl. 76, fig. 1.

The species of this genus are principally from the islands on the African coast, the greater part coming from Madagascar, the Isle of France, the Seychelles, and the Island of Socotora.

Species of Giblus.

admodestus, *Migh.*
Antoni, *Pfeiff.*
farinosus, *Trosch.*
fusus, *Lam.*
Guineensis, *Beck.*
intermedius, *Morel.*
Lamarckii, *Aud.*
latus, *C. B. Adams.*
Liberianus, *Lea.*
Lyonetianus, *Pallas.*
minor, *Morel.*
modiolus, *Férus.*
Newcombi, *Pfeiff.*
ovoideus, *Brug.*
pagoda, *Férus.*
pupulus, *Morel.*
simplex, *Gould.*
sulcatus, *Müll.*
versipolis, *Férus.*

Genus BOYSIA, Pfeiffer.

Shell conically globose, thin, rimate, the last whorl arcuately ascending; aperture oblique, bent upwards, sub-circular; peristome continuous, edentulous.

Syn. Hypostoma, *Albers.*

Ex. B. Bensoni, *Pfeiffer*, pl. 76, fig. 2.

One species only of this genus, which somewhat resembles *Anostoma* without the teeth, has yet been described, and which is an inhabitant of the East Indies.

Genus PUPA, Draparnaud.

Shell rimate, very rarely umbilicated, solid, cylindrical or oblong-ovate, apex conical, very closely costulated with straight ridges, whorls 9—12, the last anteriorly often ascending, attenuated at the base; columella dentiform-plicate; aperture semi-oval or sub-circular, generally lividly fuscous internally, apertural paries furnished with a deep lamina; peristome thickened, expanded, reflexed, the margins joined by a rather thick callus.

Syn. Strophia, *Albers.* Saraphia, *Risso.*

Ex. P. chrysalis, *Férussac,* pl. 76, fig. 3. Shell, P. uva, *Linnæus,* fig. 3, *a.*

The species of this genus, as properly restricted, chiefly inhabit the West Indies, being found in Cuba, Hayti, Guadeloupe, Martinique, Portorico, and St. Thomas. The species of the group *Torquilla* are inhabitants of Britain, Southern Europe, Mexico, and the East and West Indies. The species of *Pupilla,* usually of small size, are chiefly European in their geographical distribution.

Species of Pupa.

alvearia, *Dillw.*
Antonii, *Küst.*
calcarea, *Pfeiff.*
chrysalis, *Férus.*
Cumingiana, *Pfeiff.*
cyclostoma, *Küst.*
decumana, *Férus.*
dimidiata, *Pfeiff.*
Küsteri, *Pfeiff.*
glans, *Küst.*
Gruneri, *Pfeiff.*
Gundlachi, *Pfeiff.*
maritima, *Pfeiff.*
Martiniana, *Küst.*
multicostata, *Küst.*
mumia, *Brug.*
mumiola, *Pfeiff.*
regia, *Bens.*
Sagraina, *Pfeiff.*
striatella, *Férus.*
tumidula, *Desh.*
utriculus, *Mke.*
uva, *Linn.*

Sub-gen. TORQUILLA, Faure-Biguet (Abida, *Leach.* Granaria, *Held.* Pupina, *Ehrenb.*, not *Viyn.* or *D'Orb.*).

Shell rimate, very seldom umbilicated, ovate-oblong, or fusiformly turreted; apex acuminated, rather acute; aperture oblong-oval, multiplicose, sometimes edentulate; peristome expanded, often white-tipped.

affinis, *Arad. and Magg.*
Apennina, *Charp.*
Bergomensis, *Charp.*
Brauni, *Rossm.*
cereana, *Mühlf.*
clausilioides, *Boubée.*

contorta, *Calc.*
cylindracea, *Ziegl.*
cylindrica, *Mich.*
duplicata, *Küst.*
frumentum, *Drap.*
fusiformis, *Küst.*
goniostoma, *Küst.*
granum, *Drap.*
Hassiaca, *Pfeiff.*
lapidaria, *Hutt.*
Lusitanica, *Rossm.*
megacheilos, *Jan.*
melitta, *Gould.*
Michaudi, *Terv.*
Michelii, *Terv.*
Moquiniana, *Küst.*
nitida, *Anton.*
obliterata, *Charp.*
occulta, *Parr.*
pachygastra, *Ziegl.*
Partioti, *Moq. Tand.*
Philippii, *Cantr.*
polyodon, *Drap.*
Pyrenæaria, *Mich.*
quinquedentata, *Born.*
Rhodia, *Roth.*
ringens, *Mich.*
Sardoa, *Cantr.*
secale, *Drap.*
subulata, *Biv.*
variabilis, *Drap.*
Vergniesiana, *Charp.*

Sub-gen. MODICELLA, H. and A. Adams.

Shell rimately perforate, fusiform-oblong, striated or smooth; spire conical, whorls slightly convex; aperture semi-oval, edentulate; peristome expanded, simple, or with a callous tubercle near the right margin.

conoidea, *Newc.*
fallax, *Say.*
Farinesii, *Desm.*
Freyeri, *Schmidt.*
modica, *Gould.*
Pacifica, *Pfeiff.*
pallida, *Phil.*
putilla, *Shuttl.*
rupestris, *Phil.*

Sub-gen. PUPILLA, Leach (Lauria, *Gray.* Eruca, *Swains.* Torquatella, *Held.* Sphyradium, *Agassiz.* Gastrodon, *Lowe*).

Shell small, deeply rimate or perforate, cylindrical; apex attenuated into an obtuse cone; aperture rounded, slightly plicose, or edentulate; peristome thin, rather expanded.

alpicola, *Charp.*
anconostoma, *Lowe.*
Anglica, *Férus.*
aridula, *Held.*
biplicata, *Mich.*
castanea, *Shuttl.*

costulata, *Nilss.*
cupa, *Jan.*
Ferrari, *Porro.*
Hoppii, *Möll.*
Huttoniana, *Bens.*
infundibuliformis, *D'Orb.*
leucodon, *Morel.*
limnæana, *Lowe.*
microspora, *Lowe.*
monodon, *Held.*
muscorum, *Linn.*
Numeyeri, *Küst.*
oblonga, *Pfeiff.*
Parreyssi, *Friv.*
Sempronii, *Charp.*
Senegalensis, *Morel.*
Sorghum, *Morel.*
Sterrii, *Voith.*
tæniata, *Shuttl.*
tutula, *Bens.*
umbilicata, *Drap.*
umbilicus, *Roth.*
Villæ, *Charp.*
vulcanica, *Küst.*

Sub-gen. LEIOSTYLA, Lowe (Charodrobia, *Albers.* Mastula, *Lowe*).

Shell narrowly umbilicated, elongated or cylindrical; aperture with many plicæ, transverse; peristome thin.

cheilogona, *Lowe.*
concinna, *Lowe.*
ferraria, *Lowe.*
fusca, *Lowe.*
irrigua, *Lowe.*
lævigata, *Lowe.*
lamellosa, *Lowe.*
laurinea, *Lowe.*
millegrana, *Lowe.*
monticola, *Lowe.*
recta, *Lowe.*
sphinctostoma, *Lowe.*
vincta, *Lowe.*

Sub-gen. ORCULA, Held.

Shell small, ovate-cylindrical, rimate or perforated; aperture semi-ovate; columella more or less plicate, apertural paries uni-lamellate; peristome reflexed or expanded, slightly thickened or simple.

cerea, *Dkr.*
clavulata, *Lam.*
conica, *Rossm.*
corticaria, *Say.*
doliolum, *Bruy.*
dolium, *Drap.*
gularis, *Rossm.*
Jumillensis, *Guirin.*
nana, *Mich.*
pumilis, *Gould.*
Schmidtii, *Küst.*
scyphus, *Friv.*

Sub-gen. ENNEA, H. and A. Adams.

Shell slightly rimate, sub-cylindrical, apex obtuse, smooth, shining, hyaline; whorls flattened, the last narrow, sulcated externally in the middle, lamellate within, with a strong plait parallel to the columella; aperture sub-circular; parietal lamella extending inwards and situated close to the right margin; peristome expanded, the right margin flexuous, thickened in the middle.

bicolor, *Hutt.*
Ceylanica, *Pfeiff.*
crystallum, *Morel.*
elegantula, *Pfeiff.*
Pirrei, *Pfeiff.*

Sub-gen. FAULA, H. and A. Adams.

Shell sinistral, rimate, ovately-conical, smooth; spire sub-cylindrical or conic, whorls flattened, the last ascending, compressed at the base; aperture semi-oval, plicate; peristome simple, nearly straight.

Capensis, *Kurr.*
Kurri, *Krauss.*
Mühlfeldti, *Küst.*
Pottebergensis, *Krauss.*

Genus VERTIGO, Müller.

Shell deeply rimate, ovate, apex attenuated, obtuse; whorls 5—6; aperture semi-oval, 4—7 plicated; peristome slightly expanded, white-lipped.

Syn. Pupella, *Swains.*

Ex. V. antivertigo, *Draparnaud*, pl. 76, fig. 4. Shell, V. pusilla, *Müller*, fig. 4, *a*.

The species of this genus are all of a small size, often hyaline, reversed, and of a brown colour. They are chiefly European in their geographical distribution, and live on the bark of trees and among moss in banks. The tentacles in this genius are rudimentary or wanting.

Species of Vertigo.

aculeata, *Müll.*
angustior, *Jeffr.*
Ascaniensis, *Schmidt.*
Barbadensis, *Pfeiff.*
bigranata, *Rossm.*
Charpentieri, *Shuttl.*
contracta, *Say.*
curta, *Anton.*
decora, *Gould.*
exilis, *C. B. Adams.*
fontana, *Krauss.*
lirata, *Gould.*
marginalba, *Pfeiff.*
miliola, *D'Orb.*
minuta, *Say.*
nodosaria, *D'Orb.*
pusilla, *Müll.*
Shuttleworthiana, *Charp.*
Strangei, *Pfeiff.*
tenuidens, *C. B. Adams.*
triplicata, *Stud.*
variolosa, *Gould.*

Sub-gen. ALÆA, Jeffreys (Craticula, *Lowe.* Staurodon, *Lowe*).

Shell cylindrical; aperture denticulated, or furnished with incontinuous plates; peristome simple, sometimes expanded.

antivertigo, *Drap.*
armifera, *Say.*
brevicostis, *Bens.*
carniata, *Gould.*
Gouldi, *Binney.*
hexodon, *C. B. Adams.*
Jamaicensis, *C. B. Adams.*
milium, *Gould.*
ovata, *Say.*
pediculus, *Shuttl.*
pellucida, *Pfeiff.*
pentodon, *Say.*
pleurophora, *Shuttl.*
pygmæa, *Drap.*
rupicola, *Say.*
saxicola, *Lowe.*
Schultzii, *Phil.*
seminulum, *Lowe.*
servilis, *Gould.*
squalina, *Rossm.*
substriata, *Jeffr.*
tantilla, *Gould.*

Sub-gen. ISTHMIA, Gray (Truncatellina, *Lowe.* Paludinella, *Lowe*, not *Pfeiff.*).

Shell deeply rimate, cylindrical, striated; apex obtuse, whorls

flat; aperture semi-oval, edentulous; peritreme nearly simple, a little reflexed, margins joined by a callus.

atomus, *Shuttl.*
columella, *Benz.*
dealbata, *Webb and Berth.*
dilucida, *Ziegl.*
edentula, *Drap.*
funicula, *Val.*
fusulus, *Müll.*
inornata, *Mich.*
lucida, *Jan.*
microspora, *Lowe.*
minutissima, *Hartm.*
Novoseelandica, *Pfeiff.*
Paredesii, *D'Orb.*
Riisei, *Pfeiff.*
truncatella, *Pfeiff.*

Sub-gen. ODONTOCYCLAS, Schlütter (Scopelophila, *Albers.* Scarabella, *Lowe.* Eryma, *Albers*).

Shell sub-perforate or flexuously rimate, conic or ovate, striated; spire convexly conical, apex obtuse; whorls slightly convex, the last compressed at the base, sometimes laterally produced and ascending; aperture triangularly oval or semi-circular, dentated; peristome simple, a little expanded, the left margin often sinuous, the right callous or dentated within.

calathiscus, *Lowe.*
cassida, *Lowe.*
cassidula, *Lowe.*
Kokeillii, *Rossm.*
plicidens, *Bens.*
Rossmässleri, *Schmidt.*

Sub-gen. ALVEARELLA, Lowe.

Shell arcuately rimate, ob-ovate, smooth or striated; spire ovate or ventricose, apex obtuse, whorls convex, the last narrow, with the base compressed, scrobiculate in front; aperture vertical, sub-triangularly oblong, dentated; peristome callous, reflexed or expanded.

capitata, *Gould.*
concinna, *Lowe.*
gibba, *Lowe.*
Menkeana, *Pfr.*
ovularis, *Oliv.*
Pfeifferi, *Krauss.*
Sturmii, *Küst.*
Wahlbergi, *Krauss.*

Genus MEGASPIRA, Lea.

Shell clausiliaform, turreted, multispiral; aperture semi-ovate; columella transversely plicated; peristome expanded, the margins unequal.

Syn. Pyrgelix, *Beck.*

Ex. M. elatior, *Spix*, pl. 76, fig. 5.

The shells of this genus are remarkable for the length of the spire, which in *M. elatior* has no less than twenty-five, close-set, narrow, but gradually-increasing whorls; the species inhabit the forests of Brazil.

Species of Megaspira.

elata, *Gould.*
elatior, *Spix.*

Genus BALEA, Prideaux.

Shell clausiliaform or clavate, multispiral; aperture semi-oval or sub-pyriform; columella somewhat uni-plicated, simple; peristome expanded, margins unequal.

Syn. Balæa, *Gray.* Balia, *Swains.* Fusulus, *Fitz.*

Ex. B. perversa, *Linnæus*, pl. 76, fig. 6. Shell, B. perversa, fig. 6, *a.*

The species of *Balea* live among moss at the roots of trees; they inhabit Britain, Norway, Hungary, Italy, and Spain.

Species of Balea.

castanea, *Pfeiff.*
glabra, *Pfeiff.*
peregrina, *Gould.*
perversa, *Linn.*
Sarsi, *Phil.*
Tristensis, *Leach.*
ventricosa, *Leach.*

Sub-gen. TEMESA, H. and A. Adams.

Shell elongated, clausiliaform, the middle whorls the largest; columella distinctly plicate.

australis, *Forbes.*
clausilioides, *Reeve.*
Funcki, *Pfeiff.*
glorifica, *Parr.*
livida, *Mke.*

Genus UROCOPTIS, Beck.

Shell rimate, ovate-cylindrical or sub-ventricose, truncate; whorls 7—10, regularly increasing, the last slightly free, obsoletely carinate or angulated; aperture sub-circular, peristome continuous, expanded, reflexed.

Syn. Cylindrella, *Pfeiffer*, not *Swains.* Thaumasia, *Albers.*

Ex. U. costata, *Guilding*, pl. 76, fig. 7. Shell, U. cylindrus, *Chemnitz*, fig. 7, *a.*

The species of this genus are found in Mexico, Hayti, Cuba, and Jamaica. The tip of the spire usually falls off when the animal has added new whorls to the shell, "a wise provision of nature," says Guilding, "since its foot being so short it would not have the power of drawing along so heavy a shell." The single species of *Diaphera* is from the Philippine Archipelago.

Species of Urocoptis.

abbreviata, *Desh.*
Adamsiana, *Pfeiff.*
alba, *C. B. Adams.*
aspera, *C. B. Adams.*
Augustæ, *C. B. Adams.*
brevis, *Pfeiff.*
carinata, *Pfeiff.*
columna, *C. B. Adams.*
cylindrus, *Chem.*
decollata, *Nyst.*
fasciata, *Chem.*
fistularis, *Morel.*

flammulata, *Pfeiff.*
Gravesii, *C. B. Adams.*
Gruneri, *Dkr.*
Hollandi, *C. B. Adams.*
hyalina, *Pfeiff.*
jejuna, *Gould.*
lata, *C. B. Adams.*
Liebmanni, *Pfeiff.*
malleata, *Pfeiff.*
Menkeana, *Pfeiff.*
monilifera, *Pfeiff.*
Moreleti, *Pfeiff.*
nobilior, *C. B. Adams.*
ovata, *Desh.*
Oviediana, *D'Orb.*
Portoricensis, *Pfeiff.*
pruinosa, *Morel.*
puncturata, *Pfeiff.*
pupæformis, *C. B. Adams.*
Salleana, *Pfeiff.*
sanguinea, *Pfeiff.*
sericea, *Pfeiff.*
tomacella, *Morel.*
zonata, *C. B. Adams.*

Sub-gen. GONGYLOSTOMA, Albers (Trachelia, *Pfeiff.*).

Shell cylindrical or fusiform, apex attenuated, slightly truncated, last whorl protracted, tapering, sometimes obsoletely angulated; aperture circular; peristome simple, expanded.

costata, *Gould.*
costulata, *C. B. Adams.*
crispula, *Pfeiff.*
elegans, *Pfeiff.*
Gouldiana, *Pfeiff.*
gracillima, *Poey.*
Humboldtiana, *Pfeiff.*
leucopleura, *Mke.*
marmorata, *Shuttl.*
perplicata, *Desh.*
Poeyana, *D'Orb.*
porrecta, *Gould.*
rosea, *Pfeiff.*
Rugeli, *Shuttl.*
Sagraiana, *Pfeiff.*
Sowerbyana, *Pfeiff.*
speluncæ, *Pfeiff.*
subtilis, *Morel.*
variegata, *Pfeiff.*
volubilis, *Morel.*

Sub-gen. BRACHYPODELLA, Beck (Brachypus, *Guild.*, not *Swains.* or *Schönh.* Siphonostoma, *Guild.*, not *Otto* or *Erich.* Mychostoma, *Albers.*)

Shell sub-cylindrical or subulate, truncated, last whorl protracted, compressly angulated, often tetragonal; aperture subquadrangular, peristome simple, expanded.

alabastrina, *Pfeiff.*
collaris, *Férus.*

Dominicensis, *Pfeiff.*
filicosta, *Shuttl.*
gracilicollis, *Férus.*
Grayana, *C. B. Adams.*
Hanleyana, *Pfeiff.*
humilis, *C. B. Adams.*
inornata, *C. B. Adams.*
pallida, *Gould.*
reticosta, *Pfeiff.*
Robertsi, *C. B. Adams.*
seminuda, *C. B. Adams.*
simplex, *C. B. Adams.*
subula, *Férus.*

Sub-gen. STROPHINA, Mörch.

Shell cylindrically-turreted, sub-ventricose, umbilicated, apex truncated; whorls convex, obliquely and symmetrically plicated; columella angulated at the base, sub-arcuated; aperture simple, sub-quadrate.

Laterradii, *Gratel.*

Sub-gen, APOMA, Beck (Casta, *Albers*).

Shell sinistrorsal, truncate, cylindrically subulate; whorls united by an oblique suture, the last very shortly free, carinated at the base; aperture oblong, circular, peristome expanded.

Agnesiana, *C. B. Adams.*
elongata, *Chem.*
gracilis, *Wood.*

Sub-gen. ACERA, Albers.

Shell rimate, cylindrical or sub-fusiform, apex conical, not truncate; last whorl shortly or not at all produced, carinated at the base; columella plicate; aperture oblong-rotundate, peristome continuous, free, expanded.

cinerea, *Pfeiff.*
Goldfussi, *Mke.*
Morini, *Morel.*
Pfeifferi, *Mke.*
Philippiana, *Pfeiff.*
Pilocerei, *Pfeiff.*
Riisei, *Pfeiff.*
Roemeri, *Pfeiff.*
scalarina, *Shuttl.*
teres, *Mke.*

Sub-gen. ANOMA, Albers.

Shell elongate, fusiformly turreted, sub-truncated, last whorl not protracted, acutely carinated at the base; aperture oblong-rotundate, effuse at the base; peristome thin, expanded, the margins disunited.

acus, *Pfeiff.*
denticulata, *Pfeiff.*
Dunkeriana, *Pfeiff.*
elatior, *C. B. Adams.*
Gossei, *Pfeiff.*
Lavalleana, *D'Orb.*
princeps, *C. B. Adams.*
pusilla, *C. B. Adams.*
similis, *C. B. Adams.*
tenella, *C. B. Adams.*
torquata, *Morel.*
tricolor, *Pfeiff.*
zebrina, *Pfeiff.*

Sub-gen. DIAPHERA, Albers.

Shell umbilicated, the umbilicus pervious as far as the apex, cylindrical, apex obtuse, not truncated; whorls flattened, the last obsoletely carinated at the base, greatly porrected; peristome shortly expanded all round.

Cumingiana, *Pfeiff.*

Genus LEIA, Albers.

Shell rimate, sub-fusiform, very smooth, apex truncated, last whorl obtusely carinated at the base; aperture oblong; columella plicato-prominent; peristome reflexed, the margins contiguous.

Ex. L. Maugeri, *Wood*, pl. 76, fig. 8.

The species of *Leia* at present known are inhabitants of the Islands of St. Thomas and Jamaica.

Species of Leia.

Blandiana, *Pfeiff.* Maugeri, *Wood.*

Genus CLAUSILIA, Draparnaud.

Shell fusiform, generally sinistrorsal; aperture elliptic or pyriform, always with two lamellæ on the contracted columellar margin, and closed with a clausium at the bottom.

Syn. Marpessa, *Gray.* Stomodonta, *Mermet.* Dyodonta, *Hartm.* Delima, *Hartm.*

Ex. C. nigricans, *Pultney*, pl. 76, fig. 9. Shell, C. bidens, *Linnæus*, fig. 9, *a.*

The species of this genus, which is characterised by the peculiar calcareous appendage in the aperture, are very numerous, and are inhabitants of Germany, Switzerland, northern Italy, the Mediterranean Islands, China, Cochin-China, and most temperate climates. We have followed Mr. Charpentier in our arrangement of the species of this extensive genus.

Species of Clausilia.

bidens, *Müll.*
canescens, *Parr.*
capillacea, *Rossm.*
cerata, *Rossm.*
Comensis, *Shuttl.*
commutata, *Rossm.*
costata, *Ziegl.*
curta, *Rossm.*
diodon, *Stud.*
fimbriata, *Mühlf.*
inserta, *Porro.*
intermedia, *Schmidt.*
Küsteri, *Rossm.*
Macedonica, *Rossm.*
marginata, *Ziegl.*
Meisneriana, *Shuttl.*
Moussoni, *Charp.*
orthostoma, *Mke.*
plumbea, *Rossm.*
regalis, *Parr.*
Sandrii, *Küst.*
straminicollis, *Parr.*

succineata, *Ziegl.*
Thomasiana, *Charp.*
turgida, *Ziegl.*
varians, *Ziegl.*
viridina, *Ziegl.*

Sub-gen. IDYLA, H. and A. Adams.

Lunule distinct; palatal plicæ few or obsolete; last whorl with a single, large, sometimes double, basal crest, peromphalus lunate, ample; aperture more or less canaliculated.

bicolor, *Pfeiff.*
bicristata, *Friv.*
Bourguignati, *Charp.*
brunnea, *Ziegl.*
carissima, *Ziegl.*
foveicollis, *Parr.*
fraudigera, *Parr.*
galeata, *Parr.*
gracilicosta, *Ziegl.*
lævicollis, *Parr.*
Lampedosæ, *Pfeiff.*
oleata, *Rossm.*
Olympica, *Friv.*
pagana, *Ziegl.*
rugicollis, *Ziegl.*
splendens, *Charp.*
strangulata, *Férus.*
torticollis, *Oliv.*

Sub-gen. ELIA, H. and A. Adams.

Spiral lamella disjoined, often very distant; peristome plicate.

biformis, *Parr.*
corpulenta, *Friv.*
mœsta, *Férus.*
plicata, *Drap.*
serrulata, *Pfeiff.*
Thessalonica, *Friv.*

Sub-gen. PAPILLIFERA, Hartmann.

Shell horny; lunule perfect; palatal plicæ and spiral lamella wanting.

candidescens, *Ziegl.*
leucostigma, *Ziegl.*
papillaris, *Müll.*
patula, *Charp.*
proboscidea, *Küst.*
rubicunda, *Küst.*
solida, *Drap.*

Sub-gen. ALOPIA, H. and A. Adams.

Shell dextrorsal, rather thin, livid, more or less plicate; lunule none; palatal plicæ many; spiral lamella disjoined; last whorl rounded at the base; peristome continuous, slightly free.

Bielzii, *Parr.*
Lischkeana, *Parr.*
pruinosa, *Parr.*

Sub-gen. HERILLA, H. and A. Adams.

Shell usually thin, smooth, shining, horny; lunule more or less perfect; spiral lamella disjoined; lower palatal plicæ strong and conspicuous.

albocincta, *Pfeiff.*
binotata, *Ziegl.*
Buschii, *Küst.*
conspurcata, *Jan.*
Dacica, *Friv.*
diminuta, *Parr.*
gibbula, *Ziegl.*
lamellata, *Ziegl.*
pellucida, *Pfeiff.*
platystoma, *Küst.*
pluviatilis, *Bens.*
septemplicata, *Phil.*
stigmatica, *Ziegl.*
Sturmii, *Küst.*

Sub-gen. ANDRÆA, Hartmann (Rupicola, *Hartm.*, not *Fleur. de Bellev.*).

Shell slender; last whorl with the base compressed at the rima into a distinct crest.

Bergeri, *Mayer.*
Charpentieri, *Küst.*
circumdata, *Friv.*
dubia, *Drap.*
gracilis, *C. Pfeiff.*
parvula, *Stud.*
pumila, *Ziegl.*
rugosa, *Drap.*
Schmidti, *Pfeiff.*
Stabilei, *Charp.*
Tettelbachiana, *Rossm.*
Villæ, *Mühlf.*
Whatelyana, *Charp.*

Sub-gen. DELIMA, Hartmann.

Shell horny, shining, more or less pellucid, showing the palatal plicæ externally; spiral lamella disjoined.

agnella, *Parr.*
albida, *Parr.*
Baldensis, *Parr.*
Biasolettiana, *Charp.*
bilabiata, *Wagn.*
blanda, *Ziegl.*
Braunii, *Charp.*
Cattaroënsis, *Ziegl.*
costulata, *Jan.*
crassilabris, *Küst.*
crenulata, *Ziegl.*
decipiens, *Rossm.*
Frayeri, *Küst.*
fulcrata, *Ziegl.*
gastrolepta, *Ziegl.*
Leccoensis, *Villa.*
lævissima, *Ziegl.*
microstoma, *Küst.*
Montenegrina, *Küst.*
opaca, *Ziegl.*
ornata, *Ziegl.*
pachygastris, *Partsch.*
pachyotoma, *Küst.*
Pæstana, *Phil.*
piceata, *Ziegl.*
planicollis, *Parr.*
planilabris, *Rossm.*
robusta, *Küst.*
satura, *Ziegl.*
semirugata, *Ziegl.*
Sirkii, *Parr.*
Stentzii, *Rossm.*
subcristata, *Küst.*
subcylindrica, *Ziegl.*
vibex, *Rossm.*
Vidovichii, *Kutsch.*
Ziegleri, *Küst.*

Sub-gen. ALINDA, H. and A. Adams (Iphigenia, *Gray*, not *Schum.*).

Lunule perfect; spiral lamella disjoined; palatal plicæ numerous; last whorl compressed at the rima into a crest; aperture distinctly canaliculated at the base.

biplicata, *Mont.*
fallax, *Rossm.*
Isabellina, *Pfeiff.*
Schwerzenbachii, *Parr.*
socialis, *Friv.*
stabilis, *Ziegl.*
vetusta, *Ziegl.*

Sub-gen. PLICAPHORA, Hartmann.

Shell distinctly striated, rather solid, opaque, rufous; last whorl rounded near the base behind the aperture; suture destitute of papillæ; spiral lamina conjoined.

badia, *Ziegl.*
densestriata, *Ziegl.*
elata, *Ziegl.*
hetæra, *Friv.*
interrupta, *Ziegl.*
lineolata, *Held.*
obscura, *Parr.*
plicatula, *Drap.*
Sieboldti, *Pfeiff.*
simplex, *Ziegl.*
Somchetica, *Hohen.*
ventricosa, *Drap.*
ventriculosa, *Ziegl.*

Sub-gen. MEDORA, H. and A. Adams.

Shell whitish or bluish, cretaceous; lunule more or less perfect; peristome continuous, free, sometimes shortly protracted.

agnata, *Partsch.*
Albersi, *Charp.*
albescens, *Mke.*
Almissana, *Küst.*
Anatolica, *Roth.*
aquila, *Parr.*
avia, *Parr.*
bigibbosa, *Charp.*
Boissieri, *Charp.*
Byzantina, *Parr.*
cærulea, *Férus.*
candida, *Pfeiff.*
Cantrainei, *Desh.*
cinerascens, *Küst.*
cinerea, *Phil.*
contaminata, *Ziegl.*
corrugata, *Chem.*
Cretensis, *Mühlf.*
Dalmatina, *Partsch.*
discolor, *Pfeiff.*
eremita, *Parr.*
Forbesiana, *Pfeiff.*
Grayana, *Pfeiff.*
grisea, *Desh.*
Grohmanniana, *Partsch.*
Hellenica, *Küst.*
inflata, *Oliv.*
inspersa, *Parr.*
Janii, *Küst.*
Kutschigii, *Küst.*
lactea, *Ziegl.*
Lesinensis, *Kutsch.*
Liebetruti, *Charp.*
Macarana, *Ziegl.*
maculosa, *Desh.*
Milleri, *Pfeiff.*

modesta, *Ziegl.*
munda, *Ziegl.*
obliqua, *Mühlf.*
Olivieri, *Roth.*
oscitans, *Férus.*
petrosa, *Parr.*
profuga, *Charp.*
punctulata, *Küst.*
saxatilis, *Parr.*
Schuchii, *Voith.*
scopulosa, *Parr.*
senilis, *Ziegl.*
Spratti, *Pfr.*
Syracusana, *Phil.*
teres, *Oliv.*
Voithii, *Rossm.*

Sub-gen. AGATHYLLA, H. and A. Adams.

Shell ribbed, ashy or pruinose; lunule none, or imperfect; spiral lamina disjoined; palatal plicæ generally two, rarely one, sometimes three or many.

abrupta, *Küst.*
aculus, *Bens.*
armata, *Kutsch.*
crispa, *Lowe.*
deltostoma, *Lowe.*
exarata, *Ziegl.*
exigua, *Lowe.*
filograna, *Ziegl.*
formosa, *Ziegl.*
irregularis, *Ziegl.*
Lowei, *Albers.*
retusa, *Oliv.*
strigillata, *Mühlf.*
sulcosa, *Mühlf.*

Sub-gen. PHÆDUSA, H. and A. Adams.

Shell smooth, more or less solid, yellowish or rufo-corneous; lunule none, or very rarely, obsolete; spiral lamella usually disjoined; last whorl appressed, rounded at the base; peristome continuous, free.

Cochinchinensis, *Pfeiff.*
cornea, *Phil.*
corticina, *V. d. Busch.*
Cumingiana, *Pfeiff.*
cylindrica, *Gray.*
Heldii, *Küst.*
Javana, *Pfeiff.*
Junghunii, *Phil.*
loxostoma, *Bens.*
Moritzii, *Mouss.*
orientalis, *V. d. Busch.*
Philippiana, *Pfeiff.*
valida, *Pfeiff.*

Sub-gen. NENIA, H. and A. Adams.

Shell ribbed or striated; lunule none; palatal plica single, superior; spiral lamella continuous; last whorl protracted, rounded at the base; peristome continuous, reflexed.

epistomium, *Küst.*
tridens, *Chem.*

Sub-gen. MENTISSA, H. and A. Adams.

Shell more or less smooth, not ribbed, horny; lunule obsolete; last whorl with a single basal crest.

acridula, *Ziegl.*
canalifera, *Rossm.*
detersa, *Ziegl*
Duboisi, *Charp.*
strumosa, *Friv.*
subtilis, *Parr.*

Sub-fam. HELICINÆ.

Shell globular or convex; spire short, the last whorl much larger than the others, composing nearly all the shell; umbilicus covered or open; aperture regular, semilunar, generally without teeth; peristome thickened or reflected.

Genus STREPTAXIS, Gray.

Shell umbilicated, irregular, globosely depressed, base shining, polished, convex, striated above, the last whorl suddenly enlarged and receding in its axis from those above; aperture edentulate, or toothed; peristome expanded, reflexed.

Syn. Artemon, *Beck.*

Ex. S. contusa, *Férussac,* pl. 77, fig. 1. Shell S. contusa, fig. 1, *a.*

According to Gould the oral tentacles in this genus are forked or bifid; the shell in young individuals is regular, but when adult the last whorl is pressed towards the side next the mouth, bending the axis out of the straight line, and producing an obliquity in the form of the whorls. Some of the species come from Western Africa, Liberia, and the Guinea coast; others are from Brazil, Cochin China, and the East Indies.

Species of Streptaxis.

aberrata, *Soul.*
albida, *Pfeiff.*
alveus, *Dkr.*
Candeana, *Petit.*
candida, *Spix.*
Cingalensis, *Bens.*
comboides, *D'Orb.*
contusa, *Férus.*
cryptodon, *Moric.*
Cumingiana, *Pfeiff.*
deformis, *Férus.*
dejecta, *Petit.*
deplanata, *Pfeiff.*
discus, *Pfeiff.*
distorta, *Jonas.*
Dunkeri, *Jonas.*
Funcki, *Pfeiff.*
glabra, *Pfeiff.*
Layardiana, *Bens.*
Maugeræ, *Gray.*
nobilis, *Gray.*
ovata, *Pfeiff.*
Peroteti, *Petit.*
Petitii, *Gould.*
prostrata, *Gould.*
pyriformis, *Pfeiff.*
Reclusiana, *Petit.*
rimata, *Pfeiff.*
Souleyetiana, *Petit.*
streptodon, *Moric.*
subregularis, *Pfeiff.*
Troberti, *Petit.*
uberiformis, *Pfeiff.*
Wagneri, *Pfeiff.*

Genus STYLODONTA, Cristofori and Jan.

Shell imperforate, above conoidal, globose at the base; whorls 6—7, regularly increasing, the last ventricose at the base, equalling the spire; columella short, sub-oblique, truncato-dentate; aperture depressly lunar or rounded;

peristome thin, expanded above, reflexed at the base, margins joined by a very thin callus.

Syn. Columplica, *Mouss.* Pachya, *Albers.*

Ex. S. unidentata, *Chemnitz*, pl. 77, fig. 2.

S. unidentata, *S. cepoides*, and *S. Studeriana* are the only species of this genus, as properly restricted, and are from the Seychelles and the Philippines. *Janira codonodes* is from the Nicobar Islands, *Erepta stylodon* comes from the Isle of France, and the other species are from India.

Species of Stylodonta.

cepoides, *Lea.* unidentata, *Chem.*
Studeriana, *Férus.*

Sub-gen. JANIRA, Albers.

Shell umbilicate, globosely conoidal, last whorl constricted, the base gibbous; peristome thickened and reflexed, the columellar margin with a dentiform protuberance, the external dilated and sinuous.

codonodes, *Pfeiff.*

Sub-gen. EREPTA, Albers.

Shell imperforate, rather depressed, solid, the last whorl subangulated; columella short, oblique, truncate, with a strong tooth; peristome simple, the basal margin somewhat thickened.

albidens, *Bens.* suffulta, *Bens.*
stylodon, *Férus.*

Genus HELIX, Linnæus.

Shell imperforate, or with the umbilicus covered, more or less globose; whorls convex, the last large, ventricose, deflexed at the aperture; aperture lunately orbicular; peristome patulous or reflexed, columellar margin dilated, callous.

Syn. Pomatia, *Beck.* Cantareus, *Risso.* Lucena, *Hartm.* Cœnatoria, *Held.* Cornucopia, *Born* (monstrosity). Plebecula, *Lowe.*

Ex. H. pomatia, *Linnæus*, pl. 77, fig. 3. Shell, H. pomatia, fig. 3, *a*.

The species of *Helix*, as properly restricted, appear to have a wide geographical distribution, being found in Europe, South and Central America, California, and China. The species of *Camæna* inhabit southern Asia, the East Indies, Birmah, China, and New Zealand; the species of *Galaxias* are widely distributed, some coming from the Cape, some from Tranquebar and Bengal, some from North Australia, and one from Europe.

Species of Helix.

aspersa, *Müll.*
Buffoniana, *Pfeiff.*
crispata, *Férus.*
eximia, *Pfeiff.*
figulina, *Parr.*
grisea, *Linn.*
Gussoneana, *Shuttl.*
helvacea, *Phil.*
Humboldtiana, *Valenc.*
ligata, *Müll.*
lucorum, *Linn.*
lutescens, *Ziegl.*
Mazzueli, *Jan.*
melanostoma, *Drap.*
nitidiuscula, *Sow.*
pomatia, *Linn.*
punctulata, *Sow.*
subplicata, *Sow*

Taurica, *Kryn.*
terrestris, *Forsk.*
Tescorum, *Bens.*
tristis, *Pfeiff.*
vulgaris, *Ziegl.*

Sub-gen. GALAXIAS, Beck.

Shell umbilicate, sub-globose; whorls convex, the last ventricose, descending at the aperture; aperture generally shining within; peristome thick, expanded, reflexed, rarely simple, obtuse, the margins approximated, often joined by a callus, the columellar dilated, reflexed, somewhat covering the umbilicus.

argillacea, *Férus.*
globulus, *Müll.*
Kraussi, *Pfeiff.*
lucana, *Müll.*
pelodes, *Pfeiff.*
platychela, *Pfeiff.*
pomum, *Pfeiff.*
semirugata, *Beck.*
Tranquebarica, *Fabr.*

Sub-gen. CAMÆNA, Albers.

Shell umbilicated, turbinately or globosely depressed; spire somewhat elevated, obtuse, last whorl anteriorly slightly deflexed, often angulated, convex at the base, compressed near the umbilicus; peristome thin, or rather thickened, expanded, the margins contiguous, the basal dilated, reflexed.

asperella, *Pfeiff.*
Batanica, *Adams and Reeve.*
bipartita, *Pfeiff.*
caliginosa, *Adams and Reeve.*
Cecillei, *Pfeiff.*
cicatrosa, *Müll.*
germana, *Reeve.*
mercatoria, *Gray.*
Merguiensis, *Phil.*
quesita, *Desh.*
Taranaki, *Gray.*

Genus EURYCRATERA, Beck.

Shell umbilicate or imperforate, thin, vesical, or obliquely ovate; whorls very rapidly increasing, the last large, inflated; aperture ample, oblique, lunately oblong; peristome simple or somewhat thickened, the margins joined by a generally thin callus, the columellar dilated and reflexed.

Syn. Helicophanta, *Beck*, not *Férus*.

Ex. E. cornu-giganteum, *Chemnitz*, pl. 77, fig. 4.

The species of *Eurycratera*, as restricted, are natives of Madagascar and Southern Africa, Australia, and New Holland. *Leiostoma* is an inhabitant of Jamaica, and the geographical distribution of *Polymita* is among the West Indies, viz. Cuba, Portorico, and St. Thomas.

Species of Eurycratera.

ampulla, *Bens.*
cornu-giganteum, *Chem.*
echinophora, *Férus.*
Falconari, *Reeve.*
Goudotiana, *Férus.*
Maconelli, *Reeve.*
magnifica, *Férus.*
oviformis, *Gratel.*

Sub-gen. LEIOSTOMA, Swainson (Leiocheila, *Albers*).

Shell imperforate, sub-globose, solid; spire short, obtuse, last whorl rapidly intumescent; aperture wide; columella arcuated, widely callous; peristome thickened, expanded or patulous; apertural paries covered with a shining callus.

Jamaicensis, *Chem.*

Sub-gen. POLYMITA, Beck (Phædra, *Albers*).

Shell imperforate or perforate, globose, shining; spire short, last whorl large, deflexed at the aperture; aperture contracted; columella dilated at the base; peristome simple, obtuse, internally labiate, the margins joined by a callus ascending on the columella.

gallopavonis, *Valenc.*
gilva, *Férus.*
muscarum, *Lea.*
nemoralina, *Petit.*
picta, *Born.*
tenuistriata, *Dkr.*
Troscheli, *Pfeiff.*
varians, *Mke.*
versicolor, *Born.*

Genus HELICOSTYLA, Férussac.

Shell imperforate, globose-conical, often covered with a deciduous, hydrophanous epidermis; spire elevated, apex very obtuse, whorls 4—8; columella solid, arcuately ascending from the broad callous base; aperture ovately lunar, nearly longitudinal, margins equal; peristome expanded, rarely, shortly reflexed.

Syn. Orustia, *Mörch.*

Ex. H. undulata, *Férussac*, pl. 77, fig. 5. Shell, H. mirabilis, *Férussac*, fig. 5, *a*.

The whole of the species are from the woods in the interior of the islands of the Phillippine Archipelago.

Species of Helicostyla.

annulata, *Sow.*
balteata, *Sow.*
Bruguieriana, *Pfeiff.*
Buschi, *Pfeiff.*
Butleri, *Pfeiff.*
collodes, *Sow.*
dimera, *Jonas.*
fenestrata, *Sow.*

florida, *Sow.*
fulgens, *Sow.*
hydrophana, *Sow.*
ignobilis, *Sow.*
Iloconensis, *Sow.*
intincta, *Gould.*
Jonasi, *Pfeiff.*
mirabilis, *Férus.*
monticula, *Sow.*
orbitula, *Sow.*
polychroa, *Sow.*
Roissyana, *Férus.*
spherica, *Sow.*
spherion, *Sow.*
tenera, *Sow.*
tephrodes, *Pfeiff.*

Sub-gen. CALLICOCHLIAS, Agassiz (Calocochlea, *Hartm.*).

Shell generally covered with a deciduous, hydrophanous epidermis, imperforate, very rarely umbilicated, globosely depressed; whorls rather flat towards the apex, the last inflated; columella often intrant, dilated, oblique; peristome widely expanded, thickened, shortly reflexed.

aurata, *Sow.*
Cailliaudi, *Desh.*
chlorochroa, *Sow.*
chrysocheila, *Sow.*
cornu-militare, *Linn.*
cretata, *Brod.*
cromyodes, *Pfeiff.*
cryptica, *Brod.*
decipiens, *Sow.*
dubiosa, *Pfeiff.*
extensa, *Müll.*
Fraseri, *Gray.*
Harfordii, *Brod.*
Incei, *Pfeiff.*
intaminata, *Gould.*
intorta, *Sow.*
latitans, *Brod.*
lignaria, *Pfeiff.*
Luzonica, *Sow.*
matruelis, *Sow.*
melanocheila, *Valenc.*
Mindanaensis, *Sow.*
monochroa, *Sow.*
Norrisii, *Sow.*
Pan, *Brod.*
plurizonata, *Adams and Reeve.*
pulcherrima, *Sow.*
semirufa, *Albers.*
speciosa, *Jay.*
undulata, *Férus.*
zonifera, *Sow.*
zonulata, *Férus.*

Sub-gen. CORASIA, Albers.

Shell imperforate, depressed, conic, thin, diaphanous, flattened above, inflated at the base, last whorl often angulated or

keeled; columella intrant, sloping angulately, united to the basal margin; peristome simple, thin, slightly marginate, the margins expanded.

Albaiensis, *Sow.*
Broderipi, *Pfeiff.*
conformis, *Férus.*
cryptoportica, *Gould.*
Dryope, *Brod.*
excentrica, *Pfeiff.*
filaris, *Valenc.*
Leytensis, *Pfeiff.*
Nais, *Pfeiff.*
nasuta, *Metcalfe.*
papyracea, *Brod.*
puella, *Brod.*
regina, *Brod.*
retusa, *Pfeiff.*
Tayloriana, *Adams and Reeve.*
Tongana, *Quoy.*
Valenciennesii, *Eyd.*
virgo, *Brod.*

Sub-gen. AXINA, Albers.

Shell imperforate, covered with a deciduous, hydrophanous epidermis, depressed or sub-trochiform; whorls flat; columella short, callous, oblique; peristome marginate, expanded above, reflexed at the base.

carbonaria, *Sow.*
Cumingi, *Pfeiff.*
Guillarmodii, *Shuttl.*
inversicolor, *Férus.*
Siquijorensis, *Brod.*
Zebuensis, *Brod.*

Sub-gen. CHLORÆA, Albers.

Shell shining, imperforate, flattened, globosely depressed or lenticular; whorls flattened, the last angulated or carinated, descending at the aperture; peristome acute, more or less expanded, the margins contiguous, the basal reflexed, adpressed.

amœna, *Pfeiff.*
constricta, *Pfeiff.*
curvilabrum, *Adams and Reeve.*
fibula, *Brod.*
Gmeliniana, *Pfeiff.*
Hanleyi, *Pfeiff.*
Hügeli, *Pfeiff.*

paradoxa, *Pfeiff.*
serena, *Beck.*
Thersites, *Brod.*
tropidophora, *Adams and Reeve.*

Sub-gen. OXYCHONA, Mörch.

Shell imperforate, trochiform, the last whorl angulated or carinated, base flattened; aperture quadrangular; peristome simple, acute, the columellar margin straight, dilated, the outer inflexed in the middle.

bifasciata, *Burrow.*
Cleryi, *Petit.*
Steursiana, *Shuttl.*

Genus ACAVUS, Montfort.

Shell imperforate, obliquely ovato-globose; whorls rapidly increasing, the last ventrorsal; aperture protracted, very oblique, oblong; columella horizontal, wide, adnate by an excavated callus to the basal margin; peristome thick, widely reflexed, the margins united by a diffuse, shining callus.

Syn. Hemitrochus, *Swainson.*

Ex. A. nemoralis, *Linnæus*, pl. 77, fig. 6. Shell, A. hæmastoma, *Linnæus*, fig. 6, *a*.

Acavus, as restricted, is from Nicobar and the Island of Ceylon; the species of *Tachea* are chiefly European; the only species of *Phasis* is from the Cape of Good Hope; and *Geotrochus* is from Amboina, New Guinea, and the Philippines.

Species of Acavus.

hæmastoma, *Linn.*
melanotragus, *Born.*
phœnix, *Pfeiff.*
ponderosus, *Pfeiff.*
superbus, *Pfeiff.*
Waltoni, *Reeve.*

Sub-gen. TACHEA, Leach (Archelix, *Albers.* Cepæa, *Held.*).

Shell imperforate, or with the umbilicus covered, globose or depressly globose; upper whorls flattened, the last convex and somewhat tumid, deflexed at the aperture; peristome reflexed, labiate, the columellar margin constricted, callous, often gibbous.

alabastrites, *Mich.*
Arabicus, *Terv.*
atrolabiatus, *Kryn.*
Codringtoni, *Gray.*
Constantinus, *Forbes.*
decorus, *Adams and Reeve.*
Dupotetianus, *Terv.*
Ehrenbergi, *Roth.*
Estella, *D'Orb.*
globularis, *Ziegl.*
hieroglyphiculus, *Mich.*
hortensis, *Müll.*
Juilleti, *Terv.*
lacteus, *Müll.*
Massylæ, *Morel.*
nemoralis, *Linn.*
Punicus, *Morel.*
Raspaillii, *Payr.*
senilis, *Morel.*
signatus, *Férus.*
splendidus, *Drap.*
sylvaticus, *Drap.*
vermiculatus, *Müll.*
Vindobonensis, *C. Pfeiff.*
xanthodon, *Anton.*

Sub-gen. PHASIS, Albers.

Shell umbilicated, thin, depressed; spire slightly elevated, base convex, whorls rapidly increasing; peristome simple, acute, columellar margin dilated, reflexed.

Menkeanus, *Pfeiff.*

Sub-gen. GEOTROCHUS, Van Hasselt.

Shell imperforate, or with the umbilicus covered, trochiform or conoidal, last whorl keeled or angulated; aperture very oblique, angulated; peristome simple, the upper margin expanded, rarely, reflexed, the basal dilated and reflexed.

antiquatus, *Adams and Reeve.*
euchroes, *Pfeiff.*
Férussaci, *Less.*
labium, *Férus.*
lentus, *Pfeiff.*
lituus, *Less.*
lonchostoma, *Mke.*
Macgillivrayi, *Forbes.*
pileiformis, *Moric.*
pileolus, *Férus.*
pileus, *Müll.*

Genus COCHLEA, Adanson.

Shell imperforate, or, very rarely, sub-perforate, depressly globose, rugulosely marked; whorls 4—5, the last anteriorly deflexed; aperture very oblique, lunately oval; peristome thickened, the margins parallel or approximate, often joined by a callus, the superior expanded, the basal rather straight, dilated and tuberculated.

Syn. Mycena, *Albers.* Otala, *Beck*, not *Schum.* Hemicycla, *Swains.* Leptaxis, *Lowe.*

Ex. C. Adansonii, *Webb and Berthelot*, pl. 77, fig. 7.

The Canary Islands, Teneriffe, the West Indies, and the West Coast of Africa, are the countries inhabited by this group.

Species of Cochlea.

Adansonii, *Webb and Berth.*
advena, *Webb and Berth.*
consobrina, *Férus.*
Desfontanea, *Morel.*
fluctuosa, *Lowe.*
furva, *Lowe.*
Gaudryi, *D'Orb.*
malleata, *Férus.*

membranacea, *Lowe.*
modesta, *Férus.*
nivosa, *Sow.*
plectilis, *Bens.*
plicaria, *Lam.*
Porto-Sanctana, *Sow.*
sarcostoma, *Webb and Berth.*
Saulcyi, *D'Orb.*
simia, *Fer.*
undata, *Lowe.*
vulcania, *Lowe.*

Sub-gen. OTALA, Schumacher (Thelidomus, *Swains.* Pachystoma, *Albers*).

Shell imperforate, very rarely narrowly umbilicated, solid, depressly-globose; spire short, obtuse, last whorl protracted at the aperture, gibbous, deflexed, often obtusely angulated; aperture narrow, irregularly lunar; peristome thickened, the margins joined by a callus, the basal often denticulate or acutely callous.

angustata, *Férus.*
aspera, *Férus.*
auricoma, *Férus.*
Bonplandi, *Lam.*
cælatura, *Férus.*
crassilabris, *Pfeiff.*
discolor, *Férus.*
incerta, *Férus.*
lima, *Férus.*
orbiculata, *Férus.*
Petitiana, *D'Orb.*
Poeyi, *Petit.*
Sagraiana, *D'Orb.*
sobrina, *Férus.*
Spengleriana, *Pfeiff.*
supertexta, *Pfeiff.*

Sub-gen. PARTHENA, Albers.

Shell imperforate, thin, depressed or globosely-depressed, last whorl ventricosely convex at the base; aperture large; columella vertical, intrant; peristome simple, acute.

angulata, *Férus.*
irradiata, *Gould.*
Natalensis, *Pfeiff.*
tenerrima, *C. B. Adams.*

Sub-gen. DIALEUCA, Albers.

Shell imperforate, depressly turbinate, flattened at the base, last whorl obtusely angulated; columella intrant, very oblique,

dilated and flattened above; peristome simple, acute, shortly expanded.

nemoraloides, *C. B. Adams.*

Sub-gen. CORYDA, Albers.

Shell imperforate, depressly or conically globose; whorls convex, the last anteriorly deflexed, excavated at the base about the columella; peristome internally somewhat thickened, the columellar margin dilated, reflexed, appressed.

alauda, *Férus.*
avellana, *Férus.*
indistincta, *Férus.*
pudibunda, *Beck.*
strobilus, *Férus.*
Troscheli, *Pfeiff.*

Genus ANOSTOMA, Fischer.

Shell orbiculate; spire convex, obtuse; aperture turned upwards, toothed.

Syn. Tomogeres, *Montf.* Angystoma, *Schum.*

Ex. A. ringens, *Linnæus*, pl. 77, fig. 8.

The great peculiarity of *Anostoma* is the fact of the last whorl taking a sudden turn and bending the aperture upwards, so as to present it on the same plane; the animal must walk with the spire of the shell downwards resting on its foot. There are about three species known, found only in Brazil.

carinatum, *Pfeiff.*
globulosum, *Lam.*
ringens, *Linn.*

Genus LUCERNA, Humphrey.

Shell depressly lenticular, or orbiculately conoidal, umbilicus covered or imperforate; whorls flattened, the last keeled

or obtusely angulated; aperture oblique, nearly horizontal, elliptic; peristome thickened, the margins joined by a callus, the basal dilated, reflexed, internally dentate, externally deeply scrobiculate.

Syn. Pleurodonta, *Fischer*. Caprinus, *Montf.* Cepolis, *Montf.* Lucernella, *Swains.*

Ex. L. acuta, *Lamarck*, pl. 77, fig. 9. Shell, L. acuta, fig. 9, *a*.

The species of this group, as restricted, are chiefly inhabitants of Jamaica, Martinique, and Guadaloupe. The species of *Serpentulus* chiefly inhabit the West-Indian Islands; *S. lampas* is from Haiti; the sub-genus *Obba* is principally from the Philippines and the Moluccas; *Dentellaria* is from Guadaloupe and Martinique; the species of *Labyrinthus* are from South America and the West Indies; and the species of *Isomeria* are from New Grenada. The group *Semicornu* or *Chloritis* is from Papua and Java; and the species of *Erigone* are from the Philippines.

Species of Lucerna.

acuta, *Lam.*
acutissima, *Desh.*
anomala, *Pfeiff.*
Bainbridgei, *Pfeiff.*
Bourcieri, *Pfeiff.*
calomorpha, *Jonas.*
candescens, *C. B. Adams.*
cara, *C. B. Adams.*
carmelita, *Férus.*
cepa, *Müll.*
Chemnitziana, *Pfeiff.*
cymatodes, *Pfeiff.*
fortis, *C. B. Adams.*
fuscolabris, *C. B. Adams.*
ingens, *C. B. Adams.*
invalida, *C. B. Adams.*
Juno, *Pfeiff.*
lucerna, *Müll.*
lychnuchus, *Müll.*
Martiniana, *Pfeiff.*
nobilis, *C. B. Adams.*
Okeniana, *Pfeiff.*
patina, *C. B. Adams.*
peracutissima, *C. B. Adams.*
perplexa, *Férus.*
picturata, *C. B. Adams.*
propenuda, *C. B. Adams.*
Schröeteriana, *Pfeiff.*

Simson, *Pfeiff.*
sinuata, *Müll.*
soror, *Férus.*
strangulata, *C. B. Adams.*
tridentata, *Férus.*
valida, *C. B. Adams.*

Sub-gen. LABYRINTHUS, Beck (Lyrostoma, *Swains.*).

Shell orbicular, depressed, convex on both sides, last whorl carinated, deflexed at the aperture, scrobiculate externally; aperture auriform, ringent; peristome continuous, free, the margins united as far as the umbilicus by an intermediate, cord-like callus, which emits a descending lamina, in the middle, to the inner lip.

annulifera, *Pfeiff.*
auriculina, *Petit.*
bifurcata, *Desh.*
Dunkeri, *Pfeiff.*
isodon, *Pfeiff.*
labyrinthus, *Chem.*
Leprieurii, *Petit.*
leucodon, *Pfeiff.*
otostoma, *Pfeiff.*
plicata, *Born.*
quadridentata, *Brod.*
Tamsiana, *Dkr.*
uncigera, *Petit.*

Sub-gen. ISOMERIA, Albers.

Shell with the last whorl constricted at the umbilicus; peristome widely expanded; aperture with two acute teeth, one on the middle of the peristome, the other on the inner lip.

atrata, *Pfeiff.*
faunus, *Phil.*
Oreas, *Kooh.*

Sub-gen. DENTELLARIA, Schumacher (Lucidula, *Swains.*).

Shell imperforate, very rarely umbilicated, solid, globose or conically globose, last whorl anteriorly deflexed, often angulated; aperture coarctate, often ringent; peristome thick, expanded, the margins variously dentate or tuberculose.

auridens, *Rang.*
badia, *Férus.*

dentiens, *Férus.*
formosa, *Férus.*
Glasiana, *Shuttl.*
Isabella, *Férus.*
Josephina, *Férus.*
monodonta, *Lea.*
nigrescens, *Wood.*
nucleola, *Rang.*
obesa, *Beck.*
pachygastra, *Gray.*
parilis, *Férus.*
pseudoparilis, *Grat.*
punctata, *Born.*

Sub-gen. SERPENTULUS, Klein (Lampadion, *Bolten.* Caracolus, *Montf.* Caracolla, *Schum.* Discodoma, *Swains.*).

Shell solid, orbiculately depressed, carinate, flattened at the base, widely umbilicated, or with the umbilicus somewhat covered, last whorl a little deflexed; aperture sub-angulated; peristome thick, the columella reflexed at the umbilicus.

angistoma, *Férus.*
Bornii, *Chem.*
caracolla, *Linn.*
excellens, *Pfeiff.*
gulosa, *Gould.*
lampas, *Müll.*
Linnæana, *Pfeiff.*
Mina, *Pfeiff.*
pyrostoma, *Férus.*
Richmondiana, *Pfeiff.*
rostrata, *Pfeiff.*
sagemon, *Beck.*
sarchocheila, *Mörch.*

Sub-gen. OBBA, Beck (Planispira, *Beck.* Pusiodon, *Swains.* Philina, *Albers.* Gallina, *Hartm.*).

Shell lenticular, or orbiculately depressed, usually umbilicated; peristome reflexed, the margins often confluent as far as the umbilicus, the basal often furnished in the middle with a dentiform tubercle.

bituberculata, *Pfeiff.*
bizonia, *Férus.*
brevidens, *Sow.*
coluber, *Beck.*
columbaria, *Sow.*
Duclosiana, *Férus.*
exceptiuncula, *Férus.*
gallinula, *Pfeiff.*
Grayana, *Pfeiff.*
Hartwegi, *Pfeiff.*
Lasallii, *Eyd.*
Listeri, *Gray.*

marginata, *Müll.*
Moricandi, *Sow.*
parmula, *Brod.*
planulata, *Lam.*
quadrifasciata, *Le Guillou.*
Reeveana, *Pfeiff.*
rota, *Brod.*
scrobiculata, *Pfeiff.*
zebra, *Pfeiff.*
zonalis, *Férus.*
zonaria, *Linn.*

Sub-gen. SEMICORNU, Klein (Chloritis, *Beck*).

Shell rather solid, perspectively umbilicated, depressly globose, concave on both sides; spire involute, the last whorl tapering, descending anteriorly; peristome somewhat thickened, the right margin expanded, the basal rather reflexed.

circumdata, *Férus.*
Gruneri, *Pfeiff.*
unguicula, *Férus.*
ungulina, *Linn.*

Sub-gen. ERIGONE, Albers.

Shell widely umbilicated, depressly globose, thin, diaphanous; spire flat, last whorl ventricose; peristome widely expanded, the margins united, the columellar dilated, patent.

discordialis, *Férus.*
quieta, *Reeve.*

Genus MACROCYCLIS, Beck.

Shell thin, widely umbilicated, depressed; whorls rapidly increasing, the last inflated at the aperture and deflexed; aperture roundly oval; peristome simple, thin, the margins approximated, the basal shortly reflexed.

Ex. M. pulchella, *Müller*, pl. 78, fig. 1. Shell. M. laxata, *Férussac*, fig. 1, *a*.

The species of *Macrocyclis*, as restricted, are from Chiloe, Valdivia, and Australia; while those of the sub-genus *Ampe-*

lita are mostly from Madagascar; those of *Lysinoë* are from Mexico and Central America; and the minute shells forming the group *Vallonia* are found under stones and loose earth in Europe and the United States of America.

Species of Macrocyclis.

Banksii, *Cuming*.
Cuninghami, *Gray*.
Forbesii, *Pfeiff*.
laxata, *Férus*.

Sub-gen. AMPELITA, Beck.

Shell widely umbilicated, thin, depressed, last whorl protracted, anteriorly deflexed, passing angulately into the large umbilicus at the base; peristome reflexed, the margins contiguous, united by a callus.

Atropos, *Férus*.
Clotho, *Férus*.
concisa, *Férus*.
consanguinea, *Férus*.
galactostoma, *Pfeiff*.
granulosa, *Férus*.
Lachesis, *Férus*.
lancula, *Férus*.
lanx, *Férus*.
Madagascariensis, *Lam*.
omphalodes, *Pfeiff*.
sepulchralis, *Férus*.
sulcosa, *Pfeiff*.
unicolor, *Pfeiff*.
Xystera, *Valenc*.
zodiaca, *Férus*.

Sub-gen. LYSINOË, H. and A. Adams (Aglaia, *Albers*, not *Renieri*).

Shell umbilicated, orbiculately convex, pilose, last whorl compressed about the umbilicus; aperture lunately rotund; peristome expanded, shortly reflexed, the margins contiguous, the columellar dilated.

Ghiesbreghtii, *Nyst*.
Hogoleuensis, *Le Guillou*.

Sub-gen. EURYSTOMA, Albers.

Shell narrowly umbilicated, depressly globose, calcareous, last whorl convex at the base, deflexed; peristome labiate, broadly expanded, the columellar margin straight, dilated, almost covering the umbilicus.

deflexa, *Pfeiff.*
fallaciosa, *Férus.*
vittata, *Müll.*

Sub-gen. VALLONIA, Risso (Zurama, *Leach.* Amplexus, *Brown*, not *J. Sow.* Circinaria, *Beck.* Corneola, *Held.* Chilostoma, *Fitz.* Acrenellus, *Agass.* Glaphyra, *Albers*).

Shell umbilicated, rather depressed, diaphanous; aperture oblique, sub-circular; peristome white, labiate, reflexed.

annulata, *Case.*
costata, *Müll.*
pulchella, *Müll.*
pygmæa, *Say.*
Tuckeri, *Pfeiff.*

Genus SOLAROPSIS, Beck.

Shell umbilicated, orbiculately depressed, rather flat above, convex below; whorls regularly increasing, the last carinated or obtusely angulated; aperture lunar (in the keeled species angulately lunar); peristome marginated, shortly reflexed, columellar margin straight, dilated.

Syn. Solarium, *Spix*, not *Lam.* Helicella, *Swains.*, not *Lam.* Ophiodermis, *Agass.*

Ex. S. pellis-serpentis, *Chemnitz*, pl. 78, fig. 2. Shell, S. pellis-serpentis, fig. 2, *a*.

The species of this genus are from tropical America, some from the north and some from the south of the equator;

S. pellis-serpentis inhabits Guiana and Cayenne; *S. Brasiliana* and *S. Moricandi*, Brazil; *S. serpens*, Bolivia; and *S. heliacea* is found in Corrientes.

Species of Solaropsis.

Brasiliana, *Desh.*
heliacea, *D'Orb.*
Moricandi, *Beck.*
pellis-serpentis, *Chem.*
serpens, *Martyn.*

Genus ANCHISTOMA, Klein.

Shell orbiculately depressed, the umbilicus open or covered; whorls 5—7, the last deflexed at the aperture, often gibbous; aperture contracted, lunate, sub-triangular; peristome reflexed, usually dentate; inner lip with a linguiform or tooth-like callus, often uniting the margins.

Syn. Stenotrema, *Rafin.* Xylotrema, *Rafin.* Ulostoma, *Albers.* Triodopsis, *Rafin.* Dædalochila, *Beck.* Isognomostoma, *Fitz.* Plicostoma, *Schlüt.*

Ex. S. thyroides, *Say*, pl. 78, fig. 3. Shell, S. convexum, *Rafinesque*, fig. 3, *a*.

The species of this group are principally American and European, being found in the United States of North America, Portugal, Greece, Carolina, Georgia, Alabama, Florida, Pensylvania, and Indiana. The remarkable form, *Drepanostoma* of Porro, which comprises but a single known species, is found in North Lombardy, where it lives under stones and leaves. The species of *Polygyratia* are from the forests of Brazil, and those of *Corilla* inhabit the East Indies, Birmah, and Ceylon.

Species of Anchistoma.

Ariadnæ, *Pfeiff.*
auriculatum, *Say.*
avarum, *Say.*
cereolum, *Mühlf.*
cheilostropha, *D'Orb.*
clausum, *Rafin.*
convexum, *Rafin.*
Couloni, *Shuttl.*
dentiferum, *Binn.*
Dorfeuilleanum, *Lea.*
Edgarianum, *Lea.*
fallax, *Say.*
fraternum, *Say.*
germanum, *Gould.*
heligmoideum, *D'Orb.*
Hindsi, *Pfeiff.*
hippocrepis, *Pfeiff.*
hirsutum, *Say.*
Hopetonense, *Shuttl.*
Janeirense, *Pfeiff.*
labyrinthicum, *Lea.*
Lecontii, *Lea.*
loricatum, *Gould.*
major, *Binn.*
microdonta, *Desh.*
monodon, *Mat. and Rack.*
obstrictum, *Say.*
oppilatum, *Morel.*
palliatum, *Say.*
paludosum, *Pfeiff.*
personatum, *Lam.*
pustulatum, *Férus.*
Röemeri, *Pfeiff.*
Rugeli, *Shuttl.*
Sayi, *Binn.*
spinosum, *Lea.*
Texasianum, *Moric.*
tridentatum, *Say.*
Troostianum, *Lea.*
uvuliferum, *Shuttl.*
ventrosulum, *Pfeiff.*
volvoxis, *Parr.*
vultuosum, *Gould.*
Yucataneum, *Morel.*

Sub-gen. MESODON, Rafinesque (Patera, *Albers*).

Shell depressly globose, umbilicate, or with the perforation covered, thin, costulately striated, last whorl deflexed; aperture rotundately lunar; peristome wide, white, angulately reflexed, sometimes marginate internally; inner lip often with an elevated callus.

albolabrum, *Say.*
appressum, *Say.*
Bethencourtianum, *Shuttl.*
Columbianum, *Lea.*
elevatum, *Say.*
labiosum, *Gould.*
Michelinianum, *Lea.*
multilineatum, *Say.*

Pensylvanicum, *Green.*
thyroides, *Say.*
Zaleta, *Say.*

Sub-gen. POLYGYRA, Say (Vortex, *Beck.* Gonostoma, *Held.*, not *Rafin.* Caracollina, *Ehrenb.* Euphemia, *Beck.* Trigonostoma, *Fitz.*, not *Blainv.*).

Shell umbilicated, arctispiral, depressly orbiculate or discoidal; aperture irregular, often dentate; peristome labiate, somewhat thickened, reflexed and generally sinuated, often externally scrobiculate.

affictum, *Férus.*
angigyra, *Ziegl.*
barbula, *Charp.*
bulbinum, *Desh.*
canaliferum, *Anton.*
Corcyrense, *Partsch.*
diodonta, *Mühlf.*
discobolus, *Shuttl.*
fastigiatum, *Say.*
gyria, *Roth.*
holosericum, *Stud.*
infrendens, *Gould.*
lens, *Férus.*
lenticulum, *Férus,*
Lusitanicum, *Pfeiff.*
obvolutum, *Müll.*
plectostoma, *Bens.*
profundum, *Say.*
Rangianum, *Férus.*
septemvolva, *Say.*
triarium, *Friv.*

Sub-gen. DREPANOSTOMA, Porro.

Shell perspectively umbilicated, orbiculate, strongly involute, the last whorl involving the others, thus rendering them conspicuous in the umbilicus, so that the shell above appears as if umbilicated.

nautiliforme, *Porro.*

Sub-gen. POLYGYRATIA, Gray (Ophiogyra, *Albers*).

Shell discoidal, flat above, concave at the base; whorls very widely spirally enrolled; peristome margined, shortly reflexed.

Charybdis, *Férus.*
polygyratum, *Born.*

Sub-gen. CORILLA, H. and A. Adams (Atopa, *Albers*, not *Fabr.*).

Shell often sinistrorsal, widely umbilicated, discoidal, plane above, convex at the base; last whorl compressed at the side, anteriorly deflexed; peristome thickened, reflexed, the margins joined by an elevated callus emitting a strong re-entering lamina.

achatinum, *Gray*.
erroneum, *Albers*.
refugum, *Gould*.
Rivolii, *Desh*.

Genus IBERUS, Montfort.

Shell usually depressly conoidal, umbilicus open or covered; whorls flattened, often exserted, the last with a keel or an acute margin; aperture lunate, angular, columellar margin callous, more or less reflexed, appressed.

Syn. Helicogena, *Risso*. Trochidea, *Brown*. Leucochroa, *Beck*. Turricula, *Beck*. Anomalia, *Mühlf*. Obelus, *Hartm*. Trochula, *Schlüt*. Crenea, *Albers*. Tectula, *Lowe*. Discula, *Lowe*.

Ex. I. Gualterianus, *Linnæus*, pl. 78, fig. 4. Shell, I. Gaulterianus, fig. 4, *a*.

This extensive group is widely distributed, being found in Spain, Sicily, Corsica, Malta, the Canary Islands, the North Coast of Africa, Egypt, Syria, and Madeira. The species of *Macularia* are from the south of Europe; *Campylæa* is almost entirely an European group, being found in Spain, France, Savoy, Dalmatia, Illyria, and the Greek Islands; the species of *Thea* and *Ægista* are from Birmah, China, Loo-Choo, Japan, and the Island of Luzon. The only species of *Helicigona* known is a native of the British Islands.

Species of Iberus.

arietinus, *Rossm.*
Bulwerii, *Wood.*
calliostoma, *Adams and Reeve.*
candidissimus, *Drap.*
cariosulus, *Mich.*
cariosus, *Oliv.*
Caroni, *Desh.*
crenimargo, *Krym.*
Dehnei, *Rossm.*
Depreauxii, *D'Orb.*
depressulus, *Parr.*
elatus, *Faure-Biguet.*
erythrostoma, *Phil.*
explanatus, *Müll.*
filimargo, *Ziegl.*
Gualterianus, *Linn.*
illibatus, *Parr.*
Jeannotianus, *Terv.*
Ludovici, *Albers.*
maculosus, *Born.*
nummus, *Ehrenb.*
Othoanus, *Forbes.*
platychelus, *Mke.*
polymorpha, *Lowe.*
rotula, *Lowe.*
rugosus, *Chem.*
scabriusculus, *Desh.*
Schombrii, *Scacchi.*
Seetzeni, *Koch.*
Segestanus, *Phil.*
serrulatus, *Beck.*
Sicanus, *Férus.*
sordulentus, *Morel.*
Spratti, *Pfeiff.*
Syrensis, *Pfeiff.*
tabellatus, *Lowe.*
tectiformis, *Sow.*
terrestris, *Chem.*
testudinalis, *Lowe.*
trochlea, *Pfeiff.*
trochoides, *Poir.*
tumulorum, *Webb and Berth.*
turcica, *Chem.*
Wollastoni, *Lowe.*

Sub-gen. LAMPADIA, Albers (Mitra, *Albers*, not *Lam.*).

Shell imperforate, thin, depressed, suddenly convex; whorls rapidly increasing, the last acutely keeled; aperture ample, angulately oval; peristome thin, expanded, shortly reflexed, the columellar margin arcuated.

Webbianus, *Lowe.*

Sub-gen. MACULARIA, Albers.

Shell perforate or imperforate, globosely depressed; whorls rather convex, the last deflexed at the aperture; peristome acute, labiate, columellar margin dilated, appressed.

acceptabilis, *Charp.*
Carsolianus, *Férus.*
circumornatus, *Férus.*
Grohmanni, *Phil.*
Hispanicus, *Partsch.*
Isilensis, *Villa.*
marmoratus, *Férus.*
Melitensis, *Férus.*
Minoricensis, *Mittre.*
muralis, *Müll.*
Nebrodensis, *Mandr.*
Niciensis, *Férus.*
Pacinianus, *Phil.*
scabriculus, *Desh.*
serpentinus, *Férus.*
strigatus, *Müll.*

Sub-gen. HELICIGONA, Risso (Chilotrema, *Leach.* Latomus, *Fitz.* Lenticula, *Held.*).

Shell widely umbilicated, lenticular, acutely carinated, last whorl deflexed at the aperture; peristome marginated, the margins confluent, free.

lapicidus, *Linn.*

Sub-gen. CAMPYLÆA, Beck (Cingulifera, *Held.*).

Shell widely umbilicated, planospiral, orbiculately depressed; whorls flattened, the last deflexed at the aperture; peristome labiate, more or less thickened, columellar margin dilated, often reflexed at the base, rarely covering the umbilicus.

Alonensis, *Férus.*
alpinus, *Faure-Biguet.*
Armeniacus, *Pfeiff.*
Audouini, *D'Orb.*
Banaticus, *Partsch.*
cærulans, *Mühlf.*
campesinus, *Esquer.*
Carascalensis, *Férus.*
cingulatus, *Stüd.*
corneus, *Drap.*
cyclolabris, *Desh.*
denudatus, *Rossm.*

desidens, *Rang.*
dilutus, *Pfeiff.*
Eichwaldi, *Pfeiff.*
electrinus, *Gould.*
faustinus, *Ziegl.*
fœtens, *Stud.*
Fontenillii, *Mich.*
frigidus, *Jan.*
glacialis, *Thomas.*
guttatus, *Oliv.*
Heldreichi, *Shuttl.*
hirtus, *Mke.*
Hispanus, *Linn.*
Hoffmanni, *Partsch.*
insolidus, *Ziegl.*
intermedius, *Férus.*
Lefebvrianus, *Férus.*
macrostoma, *Mühlf.*
Narzanensis, *Friv.*
Naxianus, *Férus.*
pauxillus, *Gould.*
Pouzolzi, *Desh.*
pratensis, *Pfeiff.*
Pyrenaicus, *Drap.*
Preslii, *Ziegl.*
Rossmässleri, *Pfeiff.*
Sadlerianus, *Ziegl.*
Schmidtii, *Ziegl.*
setipila, *Ziegl.*
setosus, *Ziegl.*
spirillus, *Gould.*
spiriplanus, *Oliv.*
sportella, *Gould.*
stenomphala, *Mke.*
strigatus, *Müll.*
strigosus, *Gould.*
tigrinus, *Jan.*
trigrammephora, *D'Orb.*
trizona, *Ziegl.*
Ziegleri, *Schmidt.*
Zinguletta, *Ziegl.*
zonatus, *Stud.*

Sub-gen. ARIANTA, Leach.

Shell perforate, depressly globose, thin, last whorl gradually descending; peristome broadly labiate, the margins parallel, the basal dilated at the umbilicus.

arbustorum, *Linn.*
Californiensis, *Lea.*
Dupetithouarsii, *Desh.*
fidelis, *Gray.*
semicastaneus, *Pfeiff.*
Townsendianus, *Lea.*

Sub-gen. ELONA, H. and A. Adams (Sterna, *Albers*, not *Linn.*).

Shell thin, horny, widely umbilicated, discoidal, flat above; spire involute, apex immersed, last whorl inflated; peristome

internally labiate, angulately expanded, the margins wide apart, the columellar slightly dilated.

Quimperianus, *Férus.*

Sub-gen. ÆGISTA, Albers.

Shell widely and deeply umbilicated; spire slightly elevated, whorls gradually increasing, the last tapering; peristome sub-labiate, shortly reflexed.

Chinensis, *Phil.*
circulus, *Pfeiff.*
oculus, *Pfeiff.*

Sub-gen. THEA, Albers.

Shell umbilicate or perforate, lenticular or a little elevated, filiformly keeled; aperture securiform; peristome thin and rather expanded above, somewhat thickened and reflexed at the base.

acuductus, *Bens.*
anceps, *Gould.*
biangulatus, *Pfeiff.*
crinigerus, *Bens.*
elegantissimus, *Pfeiff.*
Guerinii, *Pfeiff.*
Indicus, *Pfeiff.*
retiferus, *Pfeiff.*
trichotropis, *Pfeiff.*

Genus OCHTHEPHILA, Beck.

Shell umbilicated or perforate, trochiform or sub-discoidal, rough with striæ and granules; whorls 4—8, the last keeled or angulated, anteriorly suddenly deflexed; aperture circular, or binately sub-circular; peristome continuous, very often free, more or less thickened and sub-reflected, or with the margins approximate and joined by a callus.

Syn. Heterostoma, *Hartm.* Geomitra, *Swains.* Coro-

naria, *Lowe*. Placentula, *Lowe*. Spirorbula, *Lowe*. Caseolus, *Lowe*.

Ex. O. bicarinata, *Sowerby*, pl. 78, fig. 5. Shell. O. bicarinata, fig. 5, *a*.

The species of this genus are from Madeira, the Islands of Porto Sancto, Teneriffe, and the Canaries.

Species of Ochthephila.

abjecta, *Lowe*.
bicarinata, *Sow*.
cheiranthicola, *Lowe*.
compar, *Lowe*.
coronata, *Desh*.
coronula, *Lowe*.
dealbata, *Lowe*.
echinulata, *Lowe*.
fictilis, *Lowe*.
latens, *Lowe*.
leptosticta, *Lowe*.
Maderensis, *Wood*.
micromphala, *Lowe*.
obtecta, *Lowe*.
oxytropis, *Lowe*.
paupercula, *Lowe*.
pyramis, *Phil*.
sphærula, *Lowe*.
tæniata, *Webb and Berth*.
tiarella, *Webb and Berth*.
turricula, *Lowe*.

Sub-gen. ACTINELLA, Lowe (Rimula, *Lowe*, not *Defr*.).

Shell narrowly umbilicated or sub-perforate, globosely depressed or orbicularly convex; the last whorl angulately carinated, scarcely descending in front; aperture oblique; peristome simple, callously plicate within, the margins more or less approximating, slightly reflexed at the base.

actinophora, *Lowe*.
arcta, *Lowe*.
arridens, *Lowe*.
calva, *Lowe*.
candisata, *Menke*.
compacta, *Lowe*.
consors, *Lowe*.
fausta, *Lowe*.
Hartungi, *Albers*.
lentiginosa, *Lowe*.
obserata, *Lowe*.

Genus HYGROMIA, Risso.

Shell umbilicate or perforated, depressly globose, horny, sometimes pilose; whorls rather convex; aperture widely lunate or lunately rotund; peristome acute, shortly expanded, internally labiate, the basal margin reflexed.

Syn. Fruticicola, *Held.* Bradybæna, *Beck.* Eulota, *Hartm.* Monacha, *Fitz.* Zenobia, *Gray.* Trichia, *Hartm.* Helicella, *Fitz.*, not *Lam.* Trochulus, *Crist.* Hispidella, *Lowe.* Janulus, *Lowe.*

Ex. H. rufescens, *Pennant*, pl. 78, fig. 6. Shell, H. cinctella, *Draparnaud*, fig. 6, *a*.

This group, centralised in Europe, has its representatives in the temperate parts of the whole earth, in Brazil, Asia, China, and the Antilles; the islands of the Indian Ocean also harbour species.

Species of Hygromia.

Armitageana, *Lowe.*
Berlanderiana, *Moric.*
Berytensis, *Férus.*
bifrons, *Lowe.*
Cantiana, *Mont.*
Carthusiana, *Müll.*
castor, *Férus.*
cestus, *Bens.*
ciliata, *Venetz.*
cinctella, *Drap.*
consona, *Ziegl.*
Coreanica, *Adams and Reeve.*
crassula, *Phil.*
depilata, *C. Pfeiff.*
diaphana, *Lam.*
dichroa, *Pfeiff.*
filicina, *Schmidt.*
flavescens, *Trosch.*
flavida, *Ziegl.*
fodiens, *Pfeiff.*
fruticola, *Kryn.*
fruticum, *Müll.*
fusiformis, *Pfeiff.*
glabella, *Drap.*
griseola, *Pfeiff.*
hispida, *Linn.*
incarnata, *Müll.*
inchoata, *Morel.*
indistincta, *Férus.*

lanuginosa, *Roissy.*
limbata, *Drap.*
multistriata, *Desh.*
obstructa, *Férus.*
occidentalis, *Recluz.*
Olivieri, *Férus.*
Orsinii, *Porro.*
pallidula, *Pfeiff.*
Parlatoris, *Biv., jun.*
pellita, *Férus.*
planorboides, *Rafin.*
plebeja, *Drap.*
Portoricensis, *Pfeiff.*
pyrrhozona, *Pfeiff.*
Ravergiensis, *Férus.*
revelata, *Férus.*
Rothi, *Pfeiff.*
rufescens, *Penn.*
sericea, *Drap.*
sordida, *Pfeiff.*
stephanophora, *Desh.*
stigmatica, *Pfeiff.*
strigella, *Drap.*
Syriaca, *Ehrenb.*
Tourannensis, *Soul.*
umbrosa, *Partsch.*
vicina, *Rossm.*
villosa, *Drap.*
Winteriana, *Pfeiff.*

Genus THEBA, Risso.

Shell turbinate or globosely depressed, rarely, orbiculately conical, calcareous, umbilicate or rimately perforate; apex shining, horny, whorls gradually increasing; aperture lunately rotund or sub-circular; peristome acute, internally labiate.

Syn. Teba, *Leach.* Xerophila, *Held.* Oxychilus, *Fitz.* Euparypha, *Hartm.* Helicopsis, *Fitz.* Cernuella, *Schlüt.*

Ex. T. virgata, *Da Costa,* pl. 78, fig. 7. Shell, T. Pisana, *Müller,* fig. 7, *a.*

The species of this group inhabit Europe and Africa; one, however, is from Texas, and another from California.

Species of Theba.

areolata, *Sow.*
armillata, *Lowe.*
Boissieri, *Charp.*
candicans, *Ziegl.*

Capensis, *Pfeiff.*
caperata, *Drap.*
cespitum, *Drap.*
cremnophila, *Boiss.*
Cretica, *Férus.*
decorata, *Pfeiff.*
Durieui, *Moq. Tand.*
ericetorum, *Müll.*
gyrostoma, *Férus.*
instabilis, *Ziegl.*
Kotschyi, *Pfeiff.*
Krynickii, *Andr.*
lemniscata, *Webb and Berth.*
maritima, *Drap.*
Meda, *Porro.*
Michaudi, *Desh.*
myristica, *Shuttl.*
neglecta, *Drap.*
nivea, *Ziegl.*
obvia, *Hartm.*
parva, *Parr.*
pellucens, *Shuttl.*
Pisana, *Müll.*
Rozeti, *Mich.*
simulata, *Férus.*
striata, *Drap.*
subclausa, *Rossm.*
submaritima, *Desm.*
subrostrata, *Férus.*
turbinata, *Jan.*
Umbicula, *Shuttl.*
ustulata, *Lowe.*
vestalis, *Parr.*
virgata, *Da Costa.*
virginalis, *Jan.*
ziczac, *Gould.*

Sub-gen. IRUS, Lowe.

Shell costulately striated, last whorl slightly deflexed; peristome continuous, a little expanded.

amanda, *Rossm.*
apicina, *Lam.*
candidula, *Stud.*
canescens, *Adams and Reeve.*
conspurcata, *Drap.*
contermina, *Shuttl.*
costulata, *Ziegl.*
cyparissias, *Parr.*
depauperata, *Lowe.*
Gigaxii, *Charp.*
laciniosa, *Lowe.*
lauta, *Lowe.*
lecta, *Férus.*
lunulata, *Kryn*
protea, *Ziegl.*
pyramidata, *Drap.*
rugosiuscula, *Mich.*
squalida, *Lowe.*
Tarentina, *Phil.*
Terveri, *Mich.*
tumulus, *Gould.*

Fam. LIMACIDÆ.

Lingual teeth tricuspid, the marginal simple, aculeate. Animal elongated, semi-cylindrical, body united to the foot. Head retractile; eye-pedicels moderate; tentacles short, club-shaped. Mantle shield-like, on the anterior and upper portion of the body; orifice of respiratory sac at the lower part of mantle, on the right side. Excretory and reproductive apertures on the right side. Foot simple posteriorly.

Shell internal, rudimentary.

As shown by the researches of Mr. William Thompson, the edge-teeth in this family have a long, projecting, single apex, the crowns of the central teeth being tricuspid. The Slugs are crepuscular or nocturnal in their habits, and are chiefly herbivorous, often producing great injury to plantations and gardens; occasionally, however, they feed on decaying vegetables and even animal substances. They seem to bear the same relation to *Helicidæ* that *Testacella* does to *Oleacinidæ*, having a lingual dentition very similar to *Vitrina*, but with the habit of raising the head, and exploring with the tentacles in the manner of the True Snails. Most of them are terrestrial, living in woods and gardens, coming forth when the dew is on the ground, and in the evenings, especially after showers; a few, however, are arboreal, and occasionally suspend themselves by a single glutinous thread to the branches of trees.

Genus LIMAX, Linnæus.

Body elongated, tapering behind. Mantle shield-like, on the fore part of the back; orifice of respiratory sac at the

right hinder border. Foot pointed, usually carinate posteriorly. Vent just below the respiratory aperture. Reproductive orifice at the hind base of the right eye-peduncle.

Shell internal, covered with a thin epidermis, ovate, flat, calcareous, with a thick posterior nucleus, and a thin membranous anterior margin.

Syn. Derocerus, *Rafin.* Eumelus, *Rafin.* Krynickia, Krynikillus, *Kalenicz.*

Ex. L. maximus, *Linnæus*, pl. 79, fig. 1. Shell, L. maximus, fig. 1, *a*.

The True Slugs prefer humid places, and are gregarious, hiding during the day under stones; they are tolerably brisk in their movements, and are especially active during the dews of evening. The corrugated or granular skin of the Slugs proper, like that of all the rest of the family, secretes an abundant mucus, but the tail is unprovided, at its end, with a muciparous pore. As in the *Helicidæ*, the mouth is furnished with a horny upper mandible, which in these animals is tri-lobed. They feed on decaying vegetable matter, and appear to be partial to Fungi; *Limax rufus*, and *L. agrestis*, consuming not only the *Boletus edulis*, but the poisonous *Agaricus muscarius* and *A. phalloides;* they like best the firm and crisp Fungi, and attack *Discomycetes*, as well as *Hymenomycetes*. The True Slugs appear to be found in most temperate countries; Europe, North America, the Cape, Canaries, and the Sandwich Islands harbouring species; in tropical climates their place seems to be occupied by *Onichidium* and *Veronicella*. The *Hyalimax perlucidus* is from the Island of Ascension.

Species of Limax.

agrestis, *Müll.*
alpinus, *Férus.*
arborum, *Bouch-Chantr.*
bilobatus, *Férus.*
brunneus, *Drap.*
campestris, *Binney.*
Canariensis, *D'Orb.*
Capensis, *Krauss.*
carinatus, *D'Orb.*
Columbianus, *Gould.*
flavus, *Linn.*
fuliginosus, *Gould.*
gagates, *Drap.*
Kraussii, *H. and A. Adams* (campestris, *Krauss.*).
Lartetii, *Dupuy.*
Livonicus, *Schrenk.*
marginatus, *Drap.*
maximus, *Linn.*
megaspidus, *Blainv.*
Natalensis, *Krauss.*
olivaceus, *Gould.*
Sowerbyi, *Férus.*
sylvaticus, *Drap.*
Sandwichensis, *Eyd.*
tenellus, *Müll.*

Sub-gen. HYALIMAX, H. and A. Adams.

Orifice of respiratory aperture in the middle of the right side of the mantle; animal pellucid.

perlucidus, *Quoy and Gaim.*

Genus PHOSPHORAX, Webb and Berthelot.

Animal slug-like. Mantle ending posteriorly in a small, concave, contractile disk surrounded by an elevated border, shining by day and phosphorescent at night. Foot simple.

Shell internal, in the middle of the mantle, above the respiratory orifice, thick, white, oval, testaceous, and nearly transparent.

Ex. P. noctilucus, *Férussac*, pl. 79, fig. 2.

This curious Slug is found in the Island of Teneriffe under

stones, and among leaves and dead twigs; it has a small pore or disk towards the hind margin of the mantle, which is of a bright shining green by day, and luminous in the dark.

Genus PHILOMYCUS, Rafinesque.

Animal slug-like, elongated, tapering behind. Eye-peduncles and tentacles retractile. Mantle shield-like, very large, covering the whole of the back; orifice of respiratory sac at the right anterior border. Foot simple behind.

Shell — ?

Syn. Limacella, *Blainv.* Meghimatium, *Van Hasselt.* Tebennophorus, *Binney.* Incillaria, *Benson.*

Ex. P. Carolinensis, *Bosc,* pl. 79, fig. 3.

The type of this genus, which is the *Limax Carolinensis* of Bosc, is found in the Southern States of North America, living principally under the bark of dead trees in humid places; the peculiarity of the genus consists in the great development of the dorsal shield or mantle, which covers the greater part of the back.

Species of Philomycus.

bilineatus, *Cantor.*
Carolinensis, *Bosc.*
dorsalis, *Binney.*

Fam. STENOPIDÆ.

Teeth numerous, nearly uniform, on a very broad lingual band. Body spiral, distinct from the foot. Eye-peduncles and tentacles retractile under the skin. Mantle produced into lobes at the fore part; respiratory orifice on the right

side. Foot long and narrow, abruptly truncated behind, and furnished with a distinct, mucous, caudal gland.

Shell external, spiral, well-developed.

In this family the mouth is provided with a serrated horny jaw, and the lingual dentition appears to be similar to that of the *Helicidæ*, from the animals of which family, however, the lobate, extended mantle-margin will distinguish them; from the *Vitrininæ* the muciparous pore and posterior truncature of the foot will at once separate them; while the spiral form of the body, protected by an external, well-developed shell, will prevent their being confounded with the *Arionidæ*, which seem to bear the same relation to the *Stenopidæ* that the True Slugs do to the *Helicidæ*.

Genus STENOPUS, Guilding.

Front edge of mantle large, closing the mouth of the shell. Foot truncated behind, with a sub-retractile appendage having a gland at its base; sole linear, narrower than the foot.

Shell perforate, conical or depressed, thin, diaphanous; whorls 5—6, the last much the widest; aperture roundly lunate; peristome simple, acute, the columellar margin involute.

Ex. S. cruentus, *Guilding*, pl. 79, fig. 4. Shell, S. cruentus, fig. 4, *a*.

Stenopus, which differs from *Nanina* in the narrow sole of the foot, consists at present of but two species, viz. *S. cruentus* and *S. lividus*, both discovered by Guilding in the Island of St. Vincent, living among dead palm leaves.

Species of Stenopus.

cruentus, *Guild.* lividus, *Guild.*

Genus NANINA, Gray.

Mantle with the front edge produced and divided into two movable lobes, which partly cover the shell. Foot truncate, and glandular at the end; sole as wide as the foot.

Shell perforate, depressed, thin, polished, granular or corrugately striated above, smooth and polished beneath; aperture lunar; peristome the thickness of the shell, straight, the columellar margin short, reflexed, often covering the umbilicus.

Syn. Xesta, *Albers.*

Ex. N. regalis, *Benson*, pl. 79, fig. 5. Shell, N. citrina, *Linnæus*, fig. 5, *a*.

The species of this genus inhabit Southern Asia and the islands of the Indian Ocean; Java, the Philippines, Molucca, New Ireland, and Ceylon, are the countries of *Ryssota*, *Hemiplecta*, and *Nanina* proper; while the islands in the Pacific Ocean, the Society Islands Pitcairn's Island, and Opara, harbour the species of *Microcystis*; *Macrochlamys* is from Guinea and Bengal; and *Cysticopsis* and *Pachystyla* are from Cuba and Bermuda. They live in thick shady woods, crawling with great vivacity among the leaves, and moving faster when disturbed; they secrete a green fluid for their defence when irritated.

Species of Nanina.

bistrialis, *Beck.*
Casca, *Gould.*
ceratodes, *Pfeiff.*
cinnamomea, *Valenc.*
citrina, *Linn.*
filocincta, *Pfeiff.*

glauca, *Bens.*
Grateloupi, *Pfeiff.*
Javanica, *Lam.*
Jenynsi, *Pfeiff.*
Juliana, *Gray.*
lubrica, *Bens.*
lutuosa, *Beck.*
maninoides, *Bens.*
Pfeifferi, *Phil.*
regalis, *Chem.*
resplendens, *Phil.*
spiralis, *Le Gillou.*
Stuartiæ, *Sow.*
trochus, *Müll.*
umbilicaria, *Le Gillou.*
vesicula, *Bens.*
vitellus, *Shuttl.*

Sub-gen. HEMIPLECTA, Albers.

Shell granular or decussately striated above, polished below; the last whorl more or less angulated or carinated.

Bataviana, *V. de Busch.*
Blainvilliana, *Lea.*
bulla, *Pfeiff.*
conoidalis, *Adams and Reeve.*
Cuvieriana, *Lea.*
densa, *Adams and Reeve.*
fulvida, *Pfeiff.*
gummata, *Sow.*
Humphreysiana, *Lea.*
labiata, *Pfeiff.*
ligulata, *Férus.*
Limaënsis, *Mouss.*
lurida, *Gould.*
Panayensis, *Brod.*
rubricata, *Gould.*
rufa, *Less.*
rufescens, *Gratel.*
semiglobosa, *Pfeiff.*
semirugata, *Beck.*
setigera, *Sow.*
Steursii, *Shuttl.*
Theodori, *Phil.*
Tranquebarica, *Fabr.*
velutina, *Sow.*
xanthotricha, *Pfeiff.*

Sub-gen. RYSSOTA, Albers.

Shell rugosely striated above, polished below; last whorl depressed, dilated anteriorly, excavated at the base around the umbilical region.

Brookei, *Adams and Reeve.*
cælatura, *Férus.*
cidaris, *Lam.*
Lamarckiana, *Lea.*
Maderaspatana, *Gray.*
monozonalis, *Lam.*
Mülleri, *Pfeiff.*
Otaheitana, *Férus.*

porphyrea, *Pfeiff.*
rapa, *Müll.*
sagittifera, *Pfeiff.*
Sowerbyana, *Pfeiff.*
stolephora, *Valenc.*
Zeus, *Jonas.*

Sub-gen. MICROCYSTIS, Beck.

Shell small, obsoletely sub-perforated, very smooth; aperture wide, sub-vertical.

Adamsi, *Pfeiff.*
aurulenta, *Beck.*
brunnea, *Anton.*
filiceti, *Beck.*
marginata, *Beck.*
misella, *Férus.*
orbis, *Beck.*
ornatella, *Beck.*
spectabilis, *Pfeiff.*
subtilis, *Anton.*
succinea, *Pfeiff.*

Sub-gen. MACROCHLAMYS, Benson (Tanychlamys, *Bens.*).

Shell globosely depressed, pellucid or horny; aperture widely lunate.

calamechroa, *Jonas.*
vitrinoides, *Desh.*

Sub-gen. PACHYSTYLA, Mörch.

Shell sub-perforate, the last whorl carinated in the middle; columella very short, vertical; aperture wide, lunar; peristome simple, the columellar margin reflected, nearly covering the umbilicus.

Mauritiana, *Lam.*
ochroleuca, *Férus.*

Sub-gen. CYSTICOPSIS, Mörch.

Shell imperforate, globose, shining; whorls convex, the last ventricose; columella short, sub-vertical, the upper part scarcely dilated; aperture large, lunately round.

Cubensis, *Pfeiff.*

Genus ARIOPHANTA, Desmoulins.

Edge of mantle enclosed, not produced into lobes.

Shell sinistral, umbilicated, thin, diaphanous, last whorl angulated or keeled; aperture oblique, lunar; peristome simple, acute, the columellar margin reflexed.

Ex. A. lævipes, *Müller*, pl. 79, fig. 6. Shell, A. lævipes, fig. 6, *a*.

The mantle in this genus does not appear to be extended beyond the shell, as in *Nanina*, and the shells are sinistrorsal, thin, and angulated at the periphery. The species are found in Southern Asia, Malabar, Birmah, Bengal, and the peninsula of Malacca.

Species of Ariophanta.

Himalajana, *Lea.*
Janus, *Chem.*
lævipes, *Müll.*
retrorsa, *Gould.*
Rumphii, *V. de Busch.*
ryssolemma, *Albers.*
trifasciata, *Chem.*

Genus PARYPHANTA, Albers.

Shell widely umbilicated, depressed, covered with a thick, shining epidermis involving the peristome; spire flat, whorls few, the last tumid, anteriorly deflexed, umbilicus perspective; aperture oblique, lunately oval; peristome simple, inflexed.

Ex. P. Busbyi, *Gray*, pl. 80, fig. 1.

The animal of this genus has not hitherto been examined, but judging from the shell, it is probable that the mantle-margin is extended and reflexed. *P. Busbyi* and *P. Green-*

woodii are inhabitants of New Zealand, and *P. atramentaria* is from New Holland; the species of the sub-genus *Amphidoxa*, the shells of which are usually variegated and thin, are principally from New Zealand, though a few are from Chili and the Island of Juan Fernandez.

Species of Paryphanta.

atramentaria, *Shuttl.*
Busbyi, *Gray.*
Caffra, *Férus.*
Greenwoodii, *Gray.*

Sub-gen. AMPHIDOXA, Albers.

Shell perforate, depressed, thin, pellucid, whorls rather convex, rapidly increasing; aperture very oblique, ample; peristome simple, acute, the margins united by a thin callus.

Chiron, *Gray.*
Coresia, *Gray.*
crebriflammis, *Pfeiff.*
epsilon, *Pfeiff.*
glabriuscula, *Pfeiff.*
Jeffreysiana, *Pfeiff.*
helicophantoides, *Pfeiff.*
marmorella, *Pfeiff.*
phlogophora, *Pfeiff.*
rapida, *Pfeiff.*
splendidula, *Pfeiff.*

Genus HELICARION, Férussac.

Mantle with two free lobes in front upon the neck, and a large lobe on the right side, covering the hind part of the shell. Foot truncate posteriorly.

Shell rotundately oval, heliciform, thin, fragile, covered with a thin epidermis; spire short; aperture large; peritreme simple, acute, straight.

Ex. H. viridis, *Quoy and Gaimard*, pl. 80, fig. 2. Shell, H. Cuvieri, *Férussac*, fig. 2, *a*.

The species of this genus have an extensive fold of the mantle developed on the right side, their foot is truncate,

and their shells are very thin, and are usually confounded with those of *Vitrina*.

Species of Helicarion.

Cuvieri, *Férus.*
flammulata, *Quoy and Gaim.*
Freycineti, *Férus.*
marcida, *Gould.*
nigra, *Quoy and Gaim.*
robusta, *Gould.*
scorpio, *Gould.*
viridis, *Quoy and Gaim.*

Fam. ARIONIDÆ.

Lingual teeth numerous, uniform, close together. Animal elongate, limaciform; body not distinct from the foot. Eye-peduncles and tentacles retractile under the skin. Mantle shield-like, on the fore part of the back; respiratory orifice on the right side. Foot with the caudal extremity rounded, somewhat truncated, with a mucous gland at the end.

Shell internal, rudimentary.

Genus ARION, Férussac.

Animal limaciform. Tentacles and eye-peduncles moderate. Mantle shield-like, on the fore part of the body; orifice of respiratory sac at the right anterior border; reproductive aperture immediately below it. Tail rounded, truncate, and furnished with a terminal mucous pore.

Shell internal, in the form of an irregular mass of calcareous granules.

Syn. Limacia, *Hartm.* Limacella, *Brard.*

Ex. A. ater, *Linnæus*, pl. 80, fig. 3.

This genus differs from *Geomalacus* in the position of the reproductive orifice, which is immediately below the respi-

ratory aperture, and, in place of a regular shell, there are merely a few calcareous granules forming a small mass in the interior of the mantle. The Arions or "Land-soles" as they have been termed, are more dull in their habits than the True Slugs, from which they are readily distinguished on account of their glanduliferous tail. The genus is represented in Europe and South Africa, and is found in Britain, Spain, and the Island of Ascension.

Species of Arion.

Ascensionis, *Quoy and Gaim.*
ater, *Linn.*
flavus, *Müll.*
foliolatus, *Gould.*
furcatus, *Férus.*
hortensis, *Férus.*
lactescens, *Blainv.*
subfuscus, *Drap.*

Genus GEOMALACUS, Allman.

Animal slug-like. Eye-peduncles moderate. Mantle shield-shaped, on the fore part of the back; orifice of respiratory sac at the right anterior margin. Genital aperture near the root of the right eye-peduncle. Tail rounded above, truncate posteriorly and furnished with a mucous gland.

Shell internal, solid, flat, ovate.

Ex. G. maculatus, *Allman*, pl. 80, fig. 4. Shell, G. maculatus, fig. 4, *a*.

This genus differs from *Arion* in the position of the generative orifice, and in having a solid, testaceous shell; from *Limax* it is at once distinguished by its glanduliferous tail, and by the anterior position of the breathing aperture. The *Geomalacus* is a native of Ireland, where it lives in damp places, among loose stones and ferns. The Authors are indebted to the kindness of Mr. Andrews, the first discoverer of

the animal, for procuring for them, at considerable trouble, living specimens, which were kept alive some time by being fed on slices of cucumber and carrot, and from one of which the figure given was obtained.

Fam. JANELLIDÆ.

Body elongated, slug-like. Tentacles none; eye-peduncles short, retractile, dilated at the base, arising from the front of the mantle. Mantle covering the entire back, with a longitudinal groove extending along the middle the whole length of the animal, and giving off branches from each side; respiratory orifice very small, circular, on the right side close to the central groove on the back. Foot not keeled, tapering, acute behind, without any sub-caudal gland. Reproductive orifice at the front part of the mantle-margin on the right side.

Shell none.

The mouth in this family is inferior, at the anterior end of the foot, with three tubercles in front formed by the continuation of the grooves of the mantle. The oculigerous peduncles arise from the front, just within the edge of the mantle; the mantle has a slightly-raised, lateral margin, leaving a rather broad space between the edge and the edge of the foot; it is thin and smooth, and the central groove sends out branches which diverge backwards; a short, straight, diverging branch is given out over the head, on each side, to the hinder base of the tentacles; it is then forked, and the two branches are continued on the under edge of the mantle to the corner of the mouth.

Genus JANELLA, Gray.

Tentacles none; eye-pedicels retractile, on the front edge of the mantle. Mantle entirely covering the back, longitudinally channelled; pulmonary aperture on the right side, near the median line. Foot narrow, simple posteriorly.

Shell none.

Syn. Athoracophorus, *Gould.*

Ex. A. bitentaculata, *Quoy and Gaimard,* pl. 80, fig. 5.

MM. Quoy and Gaimard first observed the animal on which this genus is founded, crawling on leaves in Tasman's Bay, New Zealand, and indicated it as a new genus, to be characterised by the absence of the inferior tentacles, the fissure along the back, the position of the pulmonary orifice on the right side near the middle of the back, and the absence of a buckler concealing a horny piece or shell. Dr. Gray observes that the genus is most nearly allied to *Philomycus*, with which it agrees in having a thin mantle covering the whole of the back, but that it differs from it in the position of the respiratory aperture, and in the presence of only two tentacles, which, instead of being placed on the head, as in *Philomycus* and all the other *Limacidæ*, are placed on the front part of the mantle. Dr. Gould, who has described the same genus under another name, has observed that the animal has the habit of coiling itself up, when at rest, in a manner not assumed by any of the *Limacidæ*.

Species of Janella.

antipodarum, *Gray.*

bitentaculata, *Quoy and Gaim.*

Fam. VERONICELLIDÆ.

Animal elongate, limaciform. Lingual dentition similar to that of *Onchidiidæ*. Mouth without horny jaws, and not covered with a buccal veil. Eyes at the end of contractile peduncles; tentacles bifid, non-retractile. Mantle greatly extended, coriaceous, smooth, covering the back; orifice of respiratory sac on the right side under the mantle-margin. Foot narrow, simple posteriorly. Vent distinct, posterior. Orifices of reproductive organs widely separated; male organ behind the right tentacle, female orifice midway on the right side beneath the mantle.

Shell none.

The animals composing this group approach very nearly those of *Onchidiidæ*, but they have bifid tentacles, and the disposition of the orifices of reproduction is different. The *Veronicellæ* of South America live in families, hiding under the trunks of trees and in fissures near the water, or on dry ground, and are never aquatic. They quit their retreats during the night, or during the day when it rains. In the dry season they remain in a torpid state under the earth, dead leaves, or stones. Continued immersion in fresh water kills them, and their drowned bodies may frequently be seen after inundations. The species of the Old World live principally upon the trees in shady places and damp parts of the forests, concealing themselves under the leaves during the greater part of the day; they crawl quickly, and leave no slimy trace behind them like the *Limacidæ*. Their eggs are large and oval, ten or fifteen being joined together in a necklace-like, gelatinous thread, which is coiled, and more or less covered with mucus.

Genus VERONICELLA, Blainville.

Head retractile under the mantle; eyes at the end of elongate, cylindrical peduncles, which are not retractile under the skin as in the *Helicidæ;* tentacles short and bifid. Mantle smooth, coriaceous, thick, covering the entire body. Foot linear, pointed behind.

Shell none.

Syn. Vaginulus, *Férus.* Vaginula, *Latr.* Veronicellus, *Mke.*

Ex. V. Taunaisii, *Férussac,* pl. 80, fig. 6.

About ten species of this genus are known, which are widely distributed, being found in India, Africa, the Philippines, South America, and the West Indies.

Species of Veronicella.

Kraussii, *Férus.*
lævis, *Blainv.*
Langsdorfii, *Férus.*
Liberiana, *Gould.*
Limayana, *Less.*
Luzonica, *Eyd. and Soul.*
Natalensis, *Krauss.*
occidentalis, *Guild.*
soleiformis, *D'Orb.*
Taunaisii, *Férus.*
Touranniana, *Eyd. and Soul.*

Fam. ONCHIDIIDÆ.

Animal slug-like. Lingual membrane broad; teeth uniform, similar, in numerous, straight, transverse rows; the central single, short, narrow, equilateral; the lateral numerous, nearly equilateral, with a broad, flat, subcentral tip. Mouth provided with a buccal veil; no horny jaws. Eyes at the end of non-retractile, cylindrical peduncles; tentacles none. Mantle coriaceous, large, shield-

like, entirely covering the back; respiratory orifice posterior, at the right side, under the margin of the mantle. Foot narrow, elongate, simple posteriorly. Vent separate from the respiratory orifice, posterior. Sexes united; male organ under right tentacle, female orifice at posterior extremity of body.

Shell none.

Mr. Albany Hancock has ascertained that the heart in *Peronia Celtica*, a British species, is placed in front of the lung, whereas in other *Pulmonifera* it is situated behind the respiratory organ. The vent, moreover, is distinct from the breathing orifice, which is not the case in the *Helicidæ* and *Arionidæ*. The animals of this group seem to approach in their habits those of the *Ellobiidæ*, living in damp situations near fresh water, or in the immediate vicinity of the sea. From the nature of their lingual armature they are probably herbivorous, feeding on the dead and decaying leaves and wood of tropical countries.

Genus ONCHIDIUM, Buchanan.

Eye-peduncles club-shaped; oral appendages lobate, simple, undivided. Mantle coriaceous, convex, tubercular.

Syn. Oncidium, *Agassiz*. Onchidia, *Swains*. ? Oris, *Risso*.

Ex. O. Typhæ, *Buchanan*, pl. 81, fig. 1, 1, *a*.

The type of this genus inhabits Bengal, where it is found on the leaves of the *Typha elephantina*. Many undiscovered species doubtless exist in equatorial regions in the damp forests and among decaying leaves and rotting fungi, but perhaps have been overlooked or confounded with the *Limaces*.

Genus ONCHIDELLA, Gray.

Eye-peduncles short; buccal appendages lobate. Mantle smooth or granular, without tufts or radiating processes on the dorsal surface.

Ex. O. granulosa, *Lesson*, pl. 81, fig. 2, 2, *a*.

The species of this genus live on aquatic plants in ditches and damp places. The absence of tufts on the back of the mantle will distinguish them from *Peronia*, and the lobate buccal appendages and simple mantle from *Onchidium* proper.

Species of Onchidella.

acinosa, *Gould.*
cinerea, *Quoy and Gaim.*
corpulenta, *Gould.*
granulosa, *Less.*
Hardwickii, *Gray.*
incisa, *Quoy and Gaim.*
irrorata, *Gould.*
marmorata, *Less.*
nana, *Phil.*
nigra, *Less.*
nigricans, *Quoy and Gaim.*
patelloidea, *Quoy and Gaim.*
Reevesii, *Gray.*

Genus PERONIA, Blainville.

Eye-peduncles short; buccal appendages lobate. Mantle with arbusculiform tufts and tubercles on the dorsal surface.

Syn. Onchidium, *Cuv.*, not *Buchan.* Onchis, *Férus.* Oncus, *Agass.* Oncis, *Herrm.*

Ex. P. Tongana, *Quoy and Gaimard*, pl. 81, fig. 3.

The animals of this group are littoral in their habits, living among the stones on beaches above high-water mark, and a little beyond the influence of the tide. They are principally known from the other genera of the family by

the arbusculiform and other appendages of the mantle, which have sometimes been mistaken for gills. One species is found on the coasts of Britain.

Species of Peronia.

Celtica, *Cuv.*
ferruginea, *Less.*
indolens, *Couth.*
marginata, *Couth.*
Mauritiana, *Blainv.*
Parthenopeia, *Chiaje.*
Peronii, *Savigny.*
punctata, *Quoy and Gaim.*
Tongana, *Quoy and Gaim.*

Genus BUCHANANIA, Lesson.

Eye-peduncles short and tapering at their ends; oral appendages simple, subulate. Mantle smooth, with a large central tubercle and radiating striæ. Foot ovate, small. Vent ? posterior, dorsal.

Ex. B. onchidioides, *Lesson*, pl. 81, fig. 4, 4, *a*.

This somewhat doubtful genus is founded upon a curious limaciform animal from the coast of Chili, and figured by M. Lesson in the Zoology of the Voyage of the Coquille. In most particulars it seems to resemble *Onchidium*, but the vent is dorsal as in *Onchidoris*, and the back of the mantle is smooth, with striæ radiating from a single central tubercle.

Sub-order LIMNOPHILA.

Tentacles sub-cylindrical or flattened, simply contractile; eyes sessile.

Animal lacustrine or fluviatile.

Fam. ELLOBIIDÆ.

Lingual membrane broad and elongated; teeth numerous, in slightly-bent, cross series; central tooth equilateral, narrow, tricuspid; lateral teeth rather inequilateral, diminishing in size towards the outer edge. Head ending in a snout; mouth with a horny, lunate upper jaw, and with two dilated buccal lobes, united above, separate below; tentacles subcylindrical, contractile; eyes sessile at the inner sides of their bases. Mantle closed, with a thickened margin; respiratory orifice posterior, on the right side. Sexes united.

Shell spiral, covered with a horny epidermis; aperture elongate, with strong folds on the inner lip; outer lip often dentate.

Animal lacustrine, usually frequenting salt marshes.

With the exception of one or two small genera, the *Ellobiidæ* are inhabitants of tropical climates, where they live in the brackish-water swamps, estuaries, and the embouchures of rivers among the stems and roots of the Mangroves. Some are found in the society of *Cyclophoridæ*, among loose stones above high-water mark, but within the influence of the tide; while others, like the *Pythiæ*, are found in damp woods near the sea, crawling over the dead and decaying leaves. The genera *Pedipes* and *Otina*, like *Truncatella* and *Paludinella* among the operculated Pulmonifers, are more marine in their habitats than most of the other genera.

Sub-fam. ELLOBIINÆ.

Animal terrestrial, living chiefly on the land. Tentacles developed, eyes at their inner bases.

Shell with the inner lip plicate; outer lip thickened or expanded.

Genus ELLOBIUM, Bolten.

Mantle-margin thickened; foot simple.

Shell oblong-oval, covered with a brown epidermis; spire short, obtuse; aperture narrow, elongated; inner lip with two or three large anterior plaits; outer lip thickened internally.

Syn. Auricula, *Lam.* Otis, *Humph.*, not *Linn.* Auriculus, *Montf.* Marsyas, *Oken.* Geovula, *Swains.*

Ex. E. subula, *Quoy and Gaimard*, pl. 82, fig. 1. Shell, E. auris-Midæ, *Linnæus*, fig. 1, *a*.

The species of this genus inhabit salt marshes and the mouths of rivers, where they crawl on the damp mud-banks and among the tangled roots of the Mangrove trees; they are principally found in tropical countries, and more especially in the Eastern Hemisphere, being most numerous in Borneo, Malacca, the Philippine Islands, and Australia, while a few only are found in West Columbia and the South Sea Islands.

Species of Ellobium.

auris-Judæ, *Linn.*
auris-Malchi, *Müll.*
auris-Midæ, *Linn.*
Boltenianum, *Phil.*
Brownii, *Phil.*
Chinense, *Pfeiff.*
dactylus, *Pfeiff.*
Dunkeri, *Pfeiff.*
elongatum, *Parr.*
Gangeticum, *Beus.*
incrassatum, *H. and A. Adams.*
Mörchi, *Mke.*
Oparicum, *H. and A. Adams.*
oryza, *H. and A. Adams.*
pallidum, *Sow.*
pellucens, *Mke.*
politum, *Metcalfe.*
pusillum, *H. and A. Adams.*
saccatum, *Pfeiff.*
semiplicatum, *H. and A. Adams.*
semisculptum, *H. and A. Adams.*

Sheepmakeri, *Petit.*
simplex, *H. and A. Adams.*
stagnale, *D'Orb.*
striatum, *Phil.*
subula, *Quoy and Gaim.*
tornatelliforme, *Petit.*
turritum, *Pfeiff.*

Genus CASSIDULA, Férussac.

Mantle-margin reflexed on the inner edge of the outer lip; foot bifid posteriorly.

Shell oval, sub-conic, solid; spire short, obtuse; aperture narrow, longitudinal; inner lip plicate anteriorly and reflected; outer lip reflexed, with an internal, marginal callus or ledge sinuated posteriorly.

Syn. Rhodostoma, *Swains.* Sidula, *Gray.* Detracia, *Gray.*

Ex. C. coffea, *Chemnitz*, pl. 82, fig. 2. Shell, C. coffea, fig. 2, *a*.

The *Cassidulæ* are usually found in Mangrove-swamps, and among loose stones near the sea-shore; some species are even seen inhabiting the water in the neighbourhood of salt-marshes, and at high tide may be noticed crawling on the sands in nearly two fathoms water. The group is entirely tropical in its geographical distribution, being most numerously represented in Australia and the Philippine Archipelago, while a few species only are found in Southern Africa.

Species of Cassidula.

anguilifera, *Petit.*
auris-felis, *Brug.*
coffea, *Chem.*
Bensoni, *Pfeiff.*
Cumingiana, *Recluz.*
doliolum, *Petit.*
faba, *Mke.*
Gruneri, *Pfeiff.*
Kraussii, *Küst.*
mustelina, *Desh.*
nucleus, *Mart.*
rugata, *Mke.*

Sowerbyana, *Pfeiff.*
sulculosa, *Mouss.*
turgida, *Pfeiff.*
zonata, *H. and A. Adams.*

Sub-gen. SARNIA, H. and A. Adams.

Shell ovato-cylindrical; spire obtuse, whorls transversely striated; aperture linear; inner lip with two anterior plaits; outer lip thickened internally, posteriorly sinuated.

avena, *Petit.*
frumentum, *Petit.*
triticea, *Phil.*

Genus PYTHIA, Bolten.

Foot ovate, simple posteriorly.

Shell ovate; spire acute, whorls compressed, with a varix on each side extending as far as the apex; aperture narrow, ringent; inner lip strongly plicate; outer lip sub-reflexed, dentate internally.

Syn. Polyodonta, *Fisch.* Scarabus, *Montf.* Scarabæa, *Sweigg.* Scarabæus, *Blainv.*, not *Linn.* Strigula, *Perry.*

Ex. P. Reeveana, *Pfeiffer*, pl. 82, fig. 3. Shell, P. scarabæus, *Linnæus*, fig. 3, *a*.

The *Pythiæ* are found in moist situations in woods near the sea, and are entirely terrestrial in their habits; they are fond of congregating together under stones, dead leaves, and in holes of rotten trees. After a shower, and during the dews of evening, they may be seen crawling actively about. They lay their eggs under damp logs, and the young animals may be observed in large numbers concealed in the crevices and under the bark of prostrate, decaying trees. The animals are very diversified in colour even in the same species, varying from a reddish mottled-brown to pale yellow, and even

white. Species of *Pythia* are most numerous in the East Indian and Philippine Islands; a few, however, have been discovered in the Pacific Islands.

Species of Pythia.

albovaricosa, *Pfeiff.*
Argenvillei, *Pfeiff.*
Borneënsis, *A. Adams.*
castanea, *Less.*
Cecillei, *Phil.*
Celebensis, *Pfeiff.*
Ceylanica, *Pfeiff.*
chalcostoma, *A. Adams.*
Cumingiana, *Petit.*
imperforata, *A. Adams.*
inflata, *Pfeiff.*
lekithostoma, *Pfeiff.*
Lessoni, *Blainv.*
Macgillivrayi, *Pfeiff.*
ovata, *Pfeiff.*
pantherina, *A. Adams.*
plicata, *Férus.*
pollex, *Hinds.*
pyramidata, *Reeve.*
Reeveana, *Pfeiff.*
scarabæus, *Linn.*
semisulcata, *A. Adams.*
sinuosa, *A. Adams.*
striata, *Reeve.*
trigona, *Trosch.*
undata, *Less.*

Genus PLECOTREMA, H. and A. Adams.

Shell ovate, solid, umbilicated; spire elevated, conic, whorls transversely grooved; aperture contracted, oblong; inner lip with three plaits, the middle plait bifid; outer lip with a marginal varix, internally bidentate.

Ex. P. typica, *H. and A. Adams,* pl. 82, fig. 4.

The head-quarters of this genus, the examples of which are all of small size, appear to be the East Indian and Philippine Islands, although Australia and the Sandwich Islands have supplied us with one or two species.

Species of Plecotrema.

bella, *H. and A. Adams.*
clausa, *H. and A. Adams.*
concinna, *H. and A. Adams.*
Cubensis, *Pfeiff.*
decussata, *H. and A. Adams.*
exarata, *H. and A. Adams.*
imperforata, *H. and A. Adams.*
inæqualis, *C. B. Adams.*
lirata, *H. and A. Adams.*
monilifera, *H. and A. Adams.*
punctigera, *H. and A. Adams.*
punctostriata, *H. and A. Adams.*
typica, *H. and A. Adams.*

Genus ALEXIA, Leach.

Foot simple beneath, without a transverse groove.

Shell oblong-ovate, imperforate, smooth; spire acuminate; aperture elongate, oval; inner lip 3—5 plaited, the posterior plait small; outer lip with the margin reflexed, thickened or dentate internally.

Syn. Phytia, *Gray.* Pythia, part, *Beck,* not *Bolt.* Ovatilla, part, *Bivon.* Jaminea, part, *Brown.*

Ex. A. denticulata, *Montagu,* pl. 82, fig. 5. Shell, A. denticulata, fig. 5, *a.*

The small shells comprising this group are chiefly European in their geographical distribution; Bermuda and Peru, however, furnish us with a few examples.

Species of Alexia.

acuta, *D'Orb.*
Bermudensis, *H. and A. Adams.*
Biasolettiana, *Küst.*
Botteriana, *Pfeiff.*
denticulata, *Mont.*
Kutshigiana, *Küst.*
microstoma, *Küst.*
myosotis, *Drap.*
obsoleta, *Pfeiff.*
Payraudeaui, *Shuttl.*
personata, *Mich.*
reflexilabris, *D'Orb.*

Genus CARYCHIUM, Müller.

Foot not transversely divided beneath.

Shell sub-cylindrical, thin, conic, ovate; spire elevated, whorls few, rounded; aperture small, oblong, longitudinal; inner lip straight, with a single fold; outer lip thickened and rather reflexed.

Syn. Auricella, part, *Jurine.*

Ex. C. minimum, *O. F. Müller*, pl. 82, fig. 6. Shell, C. minimum, fig. 6, *a.*

This genus is composed of small shells resembling those of *Vertigo* or *Pupilla;* the absence of operculum will distinguish them from *Diplommatina,* and the position of the eyes from the genera of *Helicidæ.* The species are amphibious, and inhabit salt marshes, being usually found at the roots of grass; they are very minute, and, with the exception of one from India, are members of the European and North American Faunas.

Species of Carychium.

elongatum, *Villa.*
exiguum, *Say.*
Indicum, *Bens.*
lautum, *Frauenf.*
minimum, *Müll.*
obesum, *Schmidt.*
Schmidti, *Frauenf.*
spectabile, *Rossm.*
spelæum, *Rossm.*

Sub-fam. MELAMPINÆ.

Animal amphibious, or living in brackish water. Tentacles developed, eyes at their inner bases.

Shell with the inner lip plicate; outer lip straight and acute.

Genus MELAMPUS, Montfort.

Foot bifid posteriorly.

Shell ovato-conical; spire short, obtuse; aperture narrow, linear; inner lip with several transverse folds; outer lip acute, internally plicate.

Syn. Pedipes, *Blainv.*, not *Adans.* Melampa, *Sweigg.*

Ex. M. coffeus, *Linnæus*, pl. 82, fig. 7. Shell, M. coffeus, fig. 7, *a*.

The *Melampi* are strictly amphibious, some of them living in clear salt water, at about the depth of a fathom, while others are inhabitants of Mangrove-swamps and the muddy banks near the mouths of rivers. West Columbia, the Sandwich Islands, and the West Indies appear to harbour numerous species of this genus, which, however, is likewise represented in Africa, Madagascar, the Philippines, South America, and New Zealand.

Species of Melampus.

acromelas, *Trosch.*
ater, *Mühlf.*
bidentatus, *Say.*
Boholensis, *H. and A. Adams.*
castaneus, *Mühlf.*
coffeus, *Linn.*
commodus, *H. and A. Adams.*
coronatus, *C. B. Adams.*
cristatus, *Pfeiff.*
flavus, *Gmel.*
Gundlachi, *Pfeiff.*
Liberianus, *H. and A. Adams.*
lividus, *Linn.*
luteus, *Quoy and Gaim.*
obovatus, *H. and A. Adams.*
parvulus, *Nutt.*
Philippii, *Küst.*
piriformis, *Petit.*
Poeyi, *Pfeiff.*
Redfieldi, *Pfeiff.*
Sincaporensis, *Pfeiff.*
spiralis, *Pfeiff.*
Tabogensis, *C. B. Adams.*
trilineatus, *C. B. Adams.*
trifasciatus, *Küst.*
Umlaasianus, *Krauss.*
Zealandicus, *H. and A. Adams.*

Genus TRALIA, Gray.

Foot posteriorly acute, entire.

Shell ovate, smooth; spire elevated; aperture narrow, linear, dilated anteriorly; inner lip usually with three oblique plaits; outer lip acute, sinuated posteriorly, internally with one or more transverse elevated ridges.

Ex. T. pusilla, *Gmelin*, pl. 82, fig. 8.

This group, which appears to have a simple, undivided tail, is chiefly obtained from the West Indian Islands, and perhaps, when the animals are better known, will be found to be merely a sub-genus of *Melampus*.

Species of Tralia.

infrequens, *C. B. Adams.*
mitralis, *H. and A. Adams.*
nitidula, *H. and A. Adams.*
olivula, *Moric.*
Panamensis, *C. B. Adams.*
pellucida, *Cooper.*
pusilla, *Gmel.*

Sub-gen. PIRA, H. and A. Adams.

Shell ovate, smooth; spire elevated; aperture narrow, linear; columella usually with three anterior plaits; outer lip internally with numerous, elevated, transverse ridges.

Adamsiana, *Pfeiff.*
angiostoma, *Desh.*
Cumingiana, *Recluz.*
fasciata, *Chem.*
Küsteri, *Krauss.*

Sub-gen. TIFATA, H. and A. Adams.

Shell sub-globose; aperture narrow, contracted; inner lip with two, spiral, elevated, lamellar plaits at the fore part; outer lip internally lirate.

cingulata, *Pfeiff.*
Floridana, *Shuttl.*
globulus, *Férus.*
pulchella, *Petit.*

Sub-gen. SIGNIA, H. and A. Adams.

Shell ovate, whorls granular, or decussated with longitudinal and transverse grooves; outer lip internally with a single, transverse, elevated rib.

exarata, *H. and A. Adams.*
granifera, *Mouss.*

Sub-gen. PERSA, H. and A. Adams.

Shell ovate; spire obtuse, whorls longitudinally ribbed and transversely striated; aperture wide; outer lip acute, simple internally.

costata, *Quoy and Gaim.*
costellaris, *H. and A. Adams.*
duplicata, *Pfeiff.*

Genus OPHICARDELUS, Beck.

Shell ovate-oblong, umbilicated, smooth; spire elevated, sub-conic; aperture oval; inner lip anteriorly dilated and reflexed, with two plaits at the fore part, the posterior spiral forming an elevated ridge round the umbilical region; outer lip thin, simple.

Ex. O. australis, *Bruguière,* pl. 82, fig. 9. Shell, O. australis, fig. 9, *a.*

Genus TRALIA, Gray.

Foot posteriorly acute, entire.

Shell ovate, smooth; spire elevated; aperture narrow, linear, dilated anteriorly; inner lip usually with three oblique plaits; outer lip acute, sinuated posteriorly, internally with one or more transverse elevated ridges.

Ex. T. pusilla, *Gmelin*, pl. 82, fig. 8.

This group, which appears to have a simple, undivided tail, is chiefly obtained from the West Indian Islands, and perhaps, when the animals are better known, will be found to be merely a sub-genus of *Melampus*.

Species of Tralia.

infrequens, *C. B. Adams.*
mitralis, *H. and A. Adams.*
nitidula, *H. and A. Adams.*
olivula, *Moric.*
Panamensis, *C. B. Adams.*
pellucida, *Cooper.*
pusilla, *Gmel.*

Sub-gen. PIRA, H. and A. Adams.

Shell ovate, smooth; spire elevated; aperture narrow, linear; columella usually with three anterior plaits; outer lip internally with numerous, elevated, transverse ridges.

Adamsiana, *Pfeiff.*
angiostoma, *Desh.*
Cumingiana, *Recluz.*
fasciata, *Chem.*
Küsteri, *Krauss.*

Sub-gen. TIFATA, H. and A. Adams.

Shell sub-globose; aperture narrow, contracted; inner lip with two, spiral, elevated, lamellar plaits at the fore part; outer lip internally lirate.

cingulata, *Pfeiff.*
Floridana, *Shuttl.*
globulus, *Férus.*
pulchella, *Petit.*

Sub-gen. SIGNIA, H. and A. Adams.

Shell ovate, whorls granular, or decussated with longitudinal and transverse grooves; outer lip internally with a single, transverse, elevated rib.

exarata, *H. and A. Adams.*
granifera, *Mouss.*

Sub-gen. PERSA, H. and A. Adams.

Shell ovate; spire obtuse, whorls longitudinally ribbed and transversely striated; aperture wide; outer lip acute, simple internally.

costata, *Quoy and Gaim.*
costellaris, *H. and A. Adams.*
duplicata, *Pfeiff.*

Genus OPHICARDELUS, Beck.

Shell ovate-oblong, umbilicated, smooth; spire elevated, sub-conic; aperture oval; inner lip anteriorly dilated and reflexed, with two plaits at the fore part, the posterior spiral forming an elevated ridge round the umbilical region; outer lip thin, simple.

Ex. O. australis, *Bruguière*, pl. 82, fig. 9. Shell, O. australis, fig. 9, *a*.

This genus, the outer lip of which is internally without transverse ribs or plaits, is found only in Australia and New Zealand.

Genus LAIMODONTA, Nuttall.

Shell oblong-ovate, imperforate, thin, transversely striated; spire elevated, conic; aperture oval; inner lip with three plaits, the anterior small; outer lip with the margin acute, posteriorly sinuated, internally with an elevated, transverse ridge.

Ex. L. Sandwichensis, *Eydoux and Souleyet*, pl. 83, fig. 1. Shell, L. Sandwichensis, fig. 1, *a*.

The groups of Islands in the Pacific harbour the species of this genus, which may be known from *Ophicardelus* by the internal, elevated rib of the outer lip.

Species of Laimodonta.

Layardi, *H. and A. Adams.*
Quoyi, *H. and A. Adams.*
Sandwichensis, *Eyd. and Soul.*
sulcata, *H. and A. Adams.*
tæniata, *Nutt.*

Genus MARINULA, King.

Foot simple inferiorly, without a transverse groove.

Shell ovate-oblong, imperforate, solid, smooth; spire short, acute; aperture obovate; inner lip broad, excavated, with three plaits, the posterior the largest; outer lip posteriorly sinuated, internally simple, the margin acute.

Ex. M. æqualis, *Lowe*, pl. 83, fig. 2. Shell, M. pepita, *King*, fig. 2, *a*.

The species of this genus inhabit salt water, Captain King having found them on wooden piles below the wash of

high-water mark. West Columbia, Chili, and Peru are the countries from which the species of *Marinula* are chiefly procured. One, *M. nigra*, of Philippi, is from the small Island of Tristan D'Acuna. The sub-genus *Turcia* is, however, European in its geographical distribution, being found in the Mediterranean; it has also been detected in Madeira.

Species of Marinula.

Callaonensis, *Petit.*
cymbæformis, *Recluz.*
nigra, *Phil.*
patula, *Lowe.*
pepita, *King.*
xanthostoma, *H. and A. Adams.*

Sub-gen. MONICA, H. and A. Adams.

Shell oblong-conical; spire elevated, whorls transversely striated; outer lip thickened internally, and furnished with three plait-like teeth.

æqualis, *Lowe.*
Firminii, *Payr.*
gracilis, *Lowe.*

Genus LEUCONIA, Gray.

Foot divided inferiorly by a transverse groove.

Shell ovate-oblong, imperforate, smooth; spire conical aperture elongate, oval; inner lip with two plaits anteriorly; outer lip smooth internally, the margin simple, acute.

Ex. L. alba, *Montagu*, pl. 83, fig. 3.

The British Islands and the North of Europe are the abodes of these little Mollusks, which are amphibious in their habits, living among the stones of sea-beaches between tide-marks.

Species of Leuconia.

alba, *Walk.*
bidentata, *Mont.*
Bivonæ, *Phil.*
Michelii, *Mittre.*
occidentalis, *Pfeiff.*
Sayi, *Küst.*
succinea, *Pfeiff.*

Genus PEDIPES, Adanson.

Foot divided inferiorly by a transverse groove.

Shell sub-globose, imperforate, transversely striated; spire short, obtuse; aperture narrow; inner lip flattened, excavated, with three plaits, the posterior the largest; outer lip posteriorly sinuated, with two teeth internally; margin acute.

Ex. P. afer, *Gmelin*, pl. 83, fig. 4, 4, *a*. Shell, P. afer, fig. 4, *b*.

When the *Pedipes* walks, the hind part of the foot is fixed, and the fore part, which is separated from the hind part by an extensible groove, is advanced, and the hind half is then drawn forwards so as to touch the anterior half, and so progression is effected by a series of little steps. This movement, similar to that of the geometric or looping caterpillars, is executed with such quickness that few Mollusks, according to Adanson, excel the *Pedipes* in alertness. The animal lives in cavities of rocks, more especially of those exposed to the sea; Lowe also found it under stones upon the sea-beach in Madeira. Species of *Pedipes* have been detected in Africa, South America, and the West Indies.

Species of Pedipes.

afer, *Gmel.*
angulatus, *C. B. Adams.*
concinnus, *C. B. Adams.*
ovalis, *C. B. Adams.*
quadridens, *Pfeiff.*
tridens, *Pfeiff.*

Sub-fam. OTININÆ.

Animal amphibious, living near the sea. Tentacles rudimentary; eyes placed on the head.

Shell ear-shaped; columellar margin simple; outer lip simple, acute.

Genus OTINA, Gray.

Tentacles nearly obsolete; eyes sessile on the upper part of the head at their hind bases. Foot divided by a transverse groove across its centre, and furnished with a creeping disk at each end.

Shell ovate, of few whorls, the first very large and ventricose, those of the spire very small; aperture large, oblong, entire; inner lip without plaits; outer lip simple, acute.

Ex. O. otis, *Fleming*, pl. 83, fig. 5. Shell, O. otis, fig. 5, *a*.

The lingual dentition of *Otina* is similar to that of *Ellobium* and other *Pulmonifera*, being in numerous cross series, with about sixty in each row; the head is large, broad, and obtuse, and the mouth, vertically cloven, is furnished with distinct jaws and a short tongue. These animals, whose shells so closely resemble those of *Velutina*, inhabit chinks of rocks between tide-marks; they progress

in the same manner as *Pedipes* by alternately fixing and moving forwards the anterior locomotive disk.

Species of Otina.

fusca, *A. Adams.* otis, *Flem.*

Fam. LIMNÆIDÆ.

Lingual membrane armed with numerous quadrate teeth, arranged in transverse rows, the central minute, the laterals uncinated. Head with a broad, short muzzle dilated at the end; mouth with a horny upper mandible; tentacles flattened or filiform, with the eyes sessile at their inner bases. Mantle-margin variously modified; respiratory orifice at the right side. Foot flattened, lanceolate or ovate. Excretory orifices on the left side of the neck.

Shell of varied form, thin, horn-coloured, usually with an oblique fold on the columella, and with the outer lip simple and acute.

Animal fluviatile, living in the water, but coming to the surface to respire the free air.

The fresh-water, air-breathing Mollusks of which this family is composed inhabit the rivers, ponds, and running streams in all parts of the globe, being, however, most numerously represented in temperate regions. They are entirely phytophagous in their habits, feeding on Confervæ and other aquatic plants. Although usually to be seen crawling on the muddy bottoms and on the stems and foliage of submerged vegetables, they always come to the surface to respire the free air, and sometimes may be observed gliding, shell downwards, on the surface of the water, anchoring or letting themselves down occasionally by means

of a glutinous thread. They deposit their ova, which are enveloped in an oblong, gelatinous nidus, on the stems and leaves of the weeds which grow around them. The form of their shells varies according to the genus, from the spiral *Limnæa* and *Physa* to the discoid *Planorbis* and *Segmentina*, and from the slipper-shaped *Gundlachia* to the limpet-like *Ancylus* and the cryptiform *Latia*. The shells are usually horn-coloured, but in their South-American representative, *Chilina*, they are ornamented with coloured spots and bands, and, as is frequently the case in fluviatile Mollusks, the apex of the spire is often found eroded.

Sub-fam. LIMNÆINÆ.

Shell spiral, more or less elongated, the last whorl large; aperture oblong.

Genus CHILINA, Gray.

Tentacles depressed, angular. Pulmonary orifice protected by a prominent, flattened appendage of the mantle.

Shell thin, oval, ventricose, with coloured spots and bands; spire obtuse; aperture oval-oblong; inner lip thickened, with one or more strong folds; outer lip simple, acute.

Syn. Dombeya, *D'Orb.* Ida, *Lea.* Potomophila, *Swains.*

Ex. C. fluctuosa, *Humphrey*, pl. 83, fig. 6. Shell, C. fluctuosa, fig. 6, *a*.

The species of *Chilina* inhabit the clear, running streams and rivers of South America, where they are found living on the rocks and stones, or crawling on the mud; in the rainy season they remain for some months under water, without ever coming to the surface. They seem to represent

in that country the *Limnææ* of more temperate regions, and are characterised by the plaits on the columella, and by the shells being ornamented with spots and coloured, undulated markings. They are found fossil in the Miocene of Patagonia and of the Rio Negro.

Species of Chilina.

ampullacea, *Sow.*
bulimoides, *Lam.*
bulloides, *D'Orb.*
Cepuelca, *D'Orb.*
Dombeyana, *Brug.*
fasciata, *Gould.*
fluctuosa, *Humph.*
fluminea, *Maton.*
fluviatilis, *Maton.*
gibbosa, *Sow.*
major, *Gray.*
obovata, *Gould.*
ovalis, *Sow.*
Parchapii, *D'Orb.*
Patagonica, *D'Orb.*
pulchra, *D'Orb.*
robustior, *Sow.*
tenuis, *Gray.*

Genus LIMNÆA, Lamarck.

Tentacles flattened, triangular. Mantle with the front edge thickened.

Shell dextral, spiral, oblong, translucent, horn-coloured; spire acute, more or less produced, last whorl ventricose; aperture large, wide, rounded in front; inner lip with an oblique fold; outer lip simple.

Syn. Limnæus, *Drap.* Lymnus, *Montf.* Limnea, *Flem.* Lymnula, Cyclemis, Espiphylla, Lomastoma, *Rafin.*

Ex. L. stagnalis, *Linnæus*, pl. 83, fig. 7. Shell, L. stagnalis, fig. 7, *a*.

The animals of this genus are found in Europe, North America, China, and in most temperate countries of the globe inhabiting the ponds and stagnant waters, where they feed on aquatic plants and on decaying vegetable substances.

They may frequently be observed floating on the surface of the water with their shells downwards, and progressing by an undulating motion of the foot; when the ponds are dried up in seasons of drought, the animals bury themselves in the mud, strengthen the outer lip of their shells by an internal rib, and close the aperture by means of an epiphragma, like the *Helicidæ* during the period of hybernation.

Species of Limnæa.

acuminata, *Lam.*
acutalis, *Morel.*
affinis, *Beck.*
ampla, *Migh.*
amygdalus, *Trosch.*
appressa, *Jay.*
chlamys, *Bens.*
columella, *Say.*
conoidea, *Say.*
jugularis, *Say.*
Karpinskii, *Siemasch.*
lepida, *Gould.*
lineata, *Say.*
longula, *Mouss.*
luteola, *Lam.*
Moreletiana, *Gassies.*
Natalensis, *Krauss.*
Ouhonensis, *Eyd.*
ovalis, *Cuv.*
pallida, *Guer.*
papyracea, *Spix.*
patula, *Trosch.*
perlævis, *Conr.*
Petitii, *Beck.*
pulchella, *Beck.*
pumila, *Kryn.*
rufescens, *Gray.*
rustica, *Andrz.*
stagnalis, *Linn.*
succiniformis, *Shuttl.*
Timorensis, *Sow.*
ventricosa, *Siemasch.*
Virginiana, *Lam.*
viridis, *Quoy.*
volutata, *Gould.*

Sub-gen. NERITOSTOMA, Klein (Radix, *Montf.* Gulnaria, *Leach*).

Shell sub-ovate, last whorl ventricose; aperture more than half the length of the shell, greatly expanded.

auricularia, *Linn.*
Balthica, *Nilss.*
Burnettii, *Alder.*
crystallina, *Ziegl.*

lagotis, *Schranck.*
Lessoni, *Desh.*
peregra, *Müll.*
scalaris, *Braun.*
succinea, *Desh.*
thermalis, *Boubé.*
Trencaleonis, *Gassies.*

Sub-gen. BULIMNEA, Haldeman.

Shell inflated, spire short; outer lip not expanded.

bulimoides, *Lea.*
bulla, *Bens.*
caperata, *Say.*
catascopium, *Say.*
cerasa, *Trosch.*
Cubensis, *Pfeiff.*
decollata, *Migh.*
desidiosa, *Say.*
diaphana, *King.*
emarginata, *Say.*
ferruginea, *Hald.*
Galbana, *Say.*
Geisericola, *Beck.*
Hookeri, *Reeve.*
humilis, *Say.*
megasoma, *Say.*
nucleus, *Trosch.*
obrussa, *Say.*
pelegera, *Shuttl.*
prunum, *Trosch.*
rugosa, *Valenc.*
Sandwichensis, *Phil.*
solida, *Lea.*
sulculata, *Trosch.*
truncatula, *Müll.*
variabilis, *Bens.*
vitrea, *Hald.*

Sub-gen. LIMNOPHYSA, Fitzinger (Stagnicola, *Leach.* Galba, *Schranck*).

Shell ovate-oblong; spire conic, about as long as the aperture, whorls rounded; outer lip not spreading.

attenuata, *Say.*
Chilensis, *Beck.*
elodes, *Say.*
expansa, *Say.*
gingivata, *Gratel.*
Holbolii, *Beck.*
impura, *Trosch.*
lanceata, *Gould.*
pallida, *C. B. Adams.*
palustris, *Linn.*
Pingelii, *Beck.*
reflexa, *Say.*
Senegalensis, *Beck.*
umbrosa, *Say.*
Vahlii, *Beck.*
viator, *D'Orb.*

Sub-gen. OMPHISCOLA, Rafinesque (Leptolimnea, *Swains.*).

Shell nearly cylindrical; spire thick, lengthened; aperture small.

glabra, *Müll.* pugio, *Beck.*

Sub-gen. ACELLA, Haldeman.

Shell very slender; whorls 4–6, flattened, oblique, suture distinct; aperture entire, produced, expanded, without fold.

gracilis, *Jay.*

Genus AMPHIPEPLEA, Nilsson.

Tentacles flattened and triangular. Mantle-margin forming an extended lobe, reflexed and partially covering the shell.

Shell hyaline, thin, globosely ventricose; spire short, depressed; aperture wide; inner lip expanded over the last whorl; outer lip simple, acute.

Syn. Lutea, *Brown.* Myxus, *Leach.* Mixus, *Say.*

Ex. A. Leuconensis, *Eydoux and Souleyet*, pl. 83, fig. 8. Shell, A. glutinosa, *Müller*, fig. 8, *a*.

According to Mr. William Thompson, the tubercle of the lateral teeth in *Amphipeplea* is very large in proportion to its plate. The even-edged, lobate mantle enveloping the shell is the obvious distinguishing characteristic of this genus, which differs from *Physa* in the triangular form of the tentacles, and in the dextral shell. The animals crawl slowly, and appear to prefer tranquil waters and muddy localities. Species have been found in the Islands of the Philippine Archipelago, and the ponds of Europe also

harbour more than one. *Amphipeplea*, as M. Philippi correctly observes, bears the same relation to *Limnæa* that *Physa* does to *Bulinus*.

Species of Amphipeplea.

Cumingi, *Pfeiff.*
glutinosa, *Müll.*
involuta, *Harvey.*
Leuconensis, *Eyd.*
Strangei, *Pfeiff.*

Genus PHYSA, Draparnaud.

Tentacles slender, setaceous. Mantle covering part of the shell, the margin fringed or digitate. Foot long, acuminate behind.

Shell sinistral, oblong, thin, polished; spire acute; aperture oval, rounded anteriorly, not dilated; inner lip spread over the last whorl, simple in front; outer lip acute.

Syn. Phyza, *Risso.* Anisus, *Studer*, not *Fitz.* Rivicola, *Fitz.*

Ex. P. fontinalis, *Linnæus*, pl. 83, fig. 9. Shell, P. fontinalis, fig. 9, *a*.

In this genus the tentacles of the animal are slender and filiform, and the edge of the mantle is extended over the shell, and fringed or furnished with digitations; the shells may be recognised by their polished surface and sinistral whorls. The *Physæ* prefer clear running streams and fountains; they are extremely quick in their movements, and are not readily intimidated. When kept in glass-vessels, they may frequently be seen to poise themselves on their foot, and rapidly vibrate their shells. They are found in Europe, North America, South Africa, India, and the

Philippines, and are tolerably numerous in species; extinct examples occur in the Wealden of Britain and France.

Species of Physa.

acuta, *Drap.*
ancillaria, *Say.*
Australiana, *Conr.*
Buschii, *Küst.*
castanea, *Lam.*
Charpentieri, *Küst.*
concolor, *Hald.*
crassula, *Dillw.*
fontinalis, *Linn.*
fragilis, *Migh. and Adams.*
Georgiana, *Quoy.*
gibbosa, *Gould.*
gyrina, *Say.*
heterostropha, *Say.*
Jamaicensis, *C. B. Adams.*
Ludivigi, *Krauss.*
Molluccensis, *Less.*
Natalensis, *Krauss.*
Novæ Hollandiæ, *Krauss.*
osculans, *Hald.*
pectorosa, *Conr.*
pumila, *Conr.*
reticulata, *Gould.*
Salleana, *Dkr.*
scalaris, *Dkr.*
Senegalensis, *Müll.*
semiplicata, *Küst.*
sinuata, *Gould.*
solida, *Phil.*
Sowerbyana, *D'Orb.*
spiculata, *Morel.*
striata, *D'Orb.*
subarata, *Mke.*
subopaca, *Lam.*
tabulata, *Gould.*
Tongana, *Quoy.*
variabilis, *Gray.*
Venetzi, *Charp.*
venustula, *Gould.*
vinosa, *Gould.*
virginea, *Gould.*

Sub-gen. PHYSELLA, Haldeman.

Shell globose, spire short; aperture elongate, very wide; columella with the fold well marked.

globosa, *Hald.*

Sub-gen. PHYSODON, Haldeman.

Shell solid, smooth, elliptical; outer lip thick; columella toothed.

microstoma, *Hald.*

Genus PHYSOPSIS, Krauss.

Shell sinistral, imperforate, ovate, thin; aperture longitudinal; inner lip none; columella involute, plicate, truncate at the fore part; outer lip simple, acute.

Ex. P. Africana, *Krauss*, pl. 83, fig. 10.

The animal of *Physopsis* has not been examined, but the peculiar conformation of the shell would seem to indicate some important difference in the mantle-margin. The only species described is from South Africa, and the shell, in having the base of the columella truncated, exhibits the same relation to *Physa* that *Achatina* does to *Bulimus* among the *Helicidæ*.

Genus CAMPTOCERAS, Benson.

Tentacles filiform, obtuse. Mantle scarcely going beyond the lips of the shell. Foot short, scarcely exceeding the length of the aperture.

Shell sinistrorsal, elongated; spire produced, whorls few, disunited; aperture oblong, entire, produced and reflexed anteriorly.

Ex. C. terebra, *Benson*, pl. 84, fig. 1.

The animal adheres, beneath the surface, to the decaying stems of a long reedy grass, in a deep piece of water in the wide alluvial bed of the Ramgunga, near Moradabad in India.

Genus BULINUS, Adanson.

Tentacles filiform, setaceous. Mantle simple-edged, and not reflexed over the shell.

Shell sinistrorsal, elongated, polished, thin; spire acuminated; aperture narrow, produced anteriorly; inner lip simple; outer lip acute.

Syn. Nauta, *Leach.* Aplexa, *Fleming.* Aplexus, *Gray.*

Ex. B. hypnorum, *Linnæus*, pl. 84, fig. 2. Shell, B. hypnorum, fig. 2, *a.*

This genus bears the same relation to *Physa* that *Limnæa* does to *Amphipeplea;* it is readily distinguished from *Physa* by the included mantle, and comprises a group with smooth, translucent, glassy shells, frequenting the freshwater ponds of Europe and America; a few species assume a considerable size, as *B. Peruvianus* from Chili, and *B. Maugeræ* from California; one species, *B. hypnorum*, is common in the weedy dykes of many parts of England.

Species of Bulinus.

abbreviatus, *Beck.*
Adansonii, *Gray.*
affinis, *Eydoux.*
elatus, *Gould.*
elongatus, *Jay.*
hypnorum, *Linn.*
impluviatus, *Morel.*
Maugeræ, *Gray.*
Peruvianus, *Gray.*
suturalis, *Beck.*
ventricosior, *Beck.*
Wahlbergi, *Krauss.*

Sub-gen. ISIDORA, Ehrenberg (Diastropha, *Guilding*).

Shell ovate, umbilicated; columella without any fold.

albus, *Turton*.
diaphanus, *Krauss*.
distortus, *Hald*.
Guildingii, *Swains*.
integer, *Hald*.
rivalis, *Mat. and Rack*.
tropicus, *Krauss*.
truncatus, *Férus*.

Sub-fam. PLANORBINÆ.

Shell spiral, discoidal or depressed, many-whorled; aperture crescentic.

Genus PLANORBIS, Guettard.

Tentacles slender, filiform. Foot short, ovate.

Shell dextral, discoidal; spire depressed, whorls numerous, visible on both sides; aperture crescentic, or transversely oval; peristome thin, incomplete, the upper margin produced.

Syn. Coretus, *Adanson*. Angarius, *Martini*. Orbis, *Schröt.*, not *Lea*. Spirodiscus, *Stein*. Planorbina, *Hald*.

Ex. P. corneus, *Linnæus*, pl. 84, fig. 3. Shell, P. corneus, fig. 3, *a*.

The species of *Planorbis* are principally inhabitants of temperate regions, and are very numerous in the northern hemisphere; they appear to be represented in the tropics by the *Ampullariidæ*, especially by the genus *Marisa*, the shells of which bear a strong resemblance to those of *Planorbis*. The tentacles of the animal are very long, and, as might have been expected from the small size of the

foot, locomotion is very slow; when irritated, a purple fluid is ejected from under the margin of the mantle. Many fossil examples occur in the tertiary formations of Europe.

Species of Planorbis.

Bahiensis, *Dkr.*
Banaticus, *Dkr.*
Beckianus, *Dkr.*
Benguelensis, *Dkr.*
Bolivianus, *Phil.*
brunneus, *Gray.*
Cannarum, *Morel.*
Cantori, *Bens.*
capillaris, *Beck.*
Chilensis, *Anton.*
cimex, *Moric.*
cœnosus, *Bens.*
Corinna, *Gray.*
corneus, *Linn.*
cornu, *Ehrenb.*
costatus, *Fabr.*
dentifer, *Moric.*
fragilis, *Dkr.*
fuscus, *Dkr.*
Gangeticus, *Beck.*
grandis, *Dkr.*
Havanensis, *Pfeiff.*
heliciformis, *Roth.*
hemispherula, *Bens.*
humilis, *C. B. Adams.*
labiatus, *Bens.*
Lanierianus, *D'Orb.*
Liebmanni, *Dkr.*
lugubris, *Wagn.*
lutescens, *Lam.*
modicus, *Bens.*
montanus, *D'Orb.*
Natalensis, *Dkr.*
orientalis, *Oliv.*
peregrinus, *D'Orb.*
Pfeifferi, *Dkr.*
Provicandi, *Beck.*
refulgens, *Dkr.*
Rossmaessleri, *Schmidt.*
rotula, *Bens.*
Rüppellii, *Dkr.*
Sindicus, *Bens.*
solidus, *Dkr.*
stramineus, *Dkr.*
Tonganensis, *Quoy.*
tumidus, *Pfeiff.*
umbilicalis, *Bens.*
vermicularis, *Gould,*
viridis, *Spix.*
zebrinus, *Dkr.*

Sub-gen. PLANORBELLA, Haldeman.

Shell with the whorls few; aperture campanulate or bell-shaped, prominent.

antrorsus, *Conr.*
campanulatus, *Say.*
proboscideus, *Mke.*

Sub-gen. HELISOMA, Swainson.

Shell ventricose, the spire sunk below the body whorl; whorls few, often angulated.

affinis, *C. B. Adams.*
bicarinatus, *Say.*
Coromandelicus, *Fabr.*
corpulentus, *Say.*
deflectus, *Say.*
Fokkesii, *Dkr.*
fovealis, *Mke.*
glabratus, *Say.*
inflatus, *Dkr.*
interruptus, *Shuttl.*
lentus, *Say.*
Maya, *Morel.*
Merguensis, *Phil.*
obesus, *Dkr.*
Peruvianus, *Brod.*
sericeus, *Dkr.*
tenagophilus, *D'Orb.*
tenuis, *Phil.*
trivolvis, *Say.*

Sub-gen. TAPHIUS, H. and A. Adams.

Shell excavated beneath, whorls rounded; aperture oval, columellar margin rectilinear.

Andecola, *D'Orb.*

Sub-gen. MENETUS, H. and A. Adams (Anisus, *Beck*, not *Fitz.* ? Hippeutis, *Agassiz*).

Shell depressed; whorls rapidly increasing, periphery angulated.

angulatus, *Phil.*
commutatus, *Dkr.*
Cumingianus, *Dkr.*
decipiens, *C. B. Adams.*
ferrugineus, *Moric.*
Guadaloupensis, *Sow.*
heloicus, *D'Orb.*
helophilus, *D'Orb.*
lenticularis, *Hartm.*
Moricandi, *Beck.*
multivolvis, *Case.*
olivaceus, *Spix.*
opercularis, *Gould.*
orbiculus, *Morel.*
pallidus, *C. B. Adams.*
Philippianus, *Dkr.*
refulgens, *Dkr.*
striatulus, *Rich.*

Sub-gen. ANISUS, Fitzinger (Trophidiscus, *Stein*).

Shell greatly depressed; whorls very numerous, periphery keeled.

carinatus, *Müll.*
depressimus, *Moric.*
dubius, *Hartm.*
kermatoides, *D'Orb.*
marginatus, *Drap.*
marmoratus, *Mich.*
subangulatus, *Phil.*
subcarinatus, *Charp.*
submarginatus, *Crist. and Jan.*
vortex, *Linn.*

Sub-gen. SPIRORBIS, Swainson.

Shell much depressed; whorls many, periphery simple.

acies, *Porro.*
anatinus, *D'Orb.*
angulatus, *Chitty.*
catillus, *Anton.*
contortus, *Linn.*
fusculus, *Parr.*
leucostoma, *Mich.*
luridus, *Pfeiff.*
Mac Nabianus, *C. B. Adams.*
magnificus, *Conr.*
nitidulus, *Dkr.*
placentula, *Kryn.*
Redfieldi, *C. B. Adams.*
Reventlowii, *Beck.*
septemgyratus, *Ziegl.*
Sibiricus, *Dkr.*
spirorbis, *Müll.*
tæniatus, *Morel.*
virens, *C. B. Adams.*

Sub-gen. NAUTILINA, Stein. (? Gyraulus, *Agassiz.*)

Shell orbicular above, flat beneath; whorls few, rapidly increasing.

albus, *Müll.*
ammoneus, *Beck.*
arcticus, *Beck.*
Brondelii, *Raym.*
Chinensis, *Dkr.*
circumlineatus, *Shuttl.*
compressus, *Hutt.*
deflectus, *Say.*
deformis, *Lam.*
dilatatus, *Gould.*

elevatus, *Say*.
exacutus, *Say*.
Gilberti, *Dkr*.
glaber, *Jeff*.
Hindsianus, *Dkr*.
Isabel, *Morel*.
limosus, *Dkr*.
nautileus, *Linn*.
nitidus, *Müll*.
orbiculus, *Morel*.
pallidus, *C. B. Adams*.
Panamensis, *Dkr*.
parvus, *Say*.
retusus, *Morel*.
Salleanus, *Dkr*.
thermalis, *Beck*.
trochoides, *Bens*.

Genus SEGMENTINA, Fleming.

Tentacles filiform.

Shell orbicular, depressed, furnished internally with transverse, testaceous partitions or teeth; aperture transversely oval, or circular.

Syn. Hemithalamus, *Leach*. Segmentaria, *Swains*. Discus, *Haldeman*.

Ex. S. armigera, *Say*, pl. 84, fig. 4. Shell, S. lacustris, *Lightfoot*, fig. 4, *a*.

In *S. lacustris* the teeth-like processes of the shell are three in number, and project so as to leave a tri-radiated aperture for the passage of the animal; the earlier ones are not absorbed, and several of the partitions thus formed are always present. In *Planorbula*, but one set of teeth, which are more numerous than in the typical species of the genus, exists in adult individuals, the septa formed at earlier periods having become absorbed.

Species of Segmentina.

calathus, *Bens*.
lacustris, *Lightfoot*.
Largillierti, *Dkr*.
perforata, *Gould*.

Sub-gen. PLANORBULA, Haldeman.

Shell with the aperture furnished with dentiform plicæ, not forming open partitions.

albicans, *Pfeiff.*
Alexandrina, *Ehrenb.*
armata, *Beck.*
armigera, *Say.*
dentata, *Dkr.*
dentiens, *Morel.*
obstructa, *Morel.*

Sub-fam. ANCYLINÆ.

Shell non-spiral, conical, limpet-like.

Genus ANCYLUS, Geoffroy.

Teeth, central 1, lateral 36. Tentacles subulate. Mantle included; pulmonary orifice protected by a branchial appendage. Foot large.

Shell sinistral, thin, patelliform, depressed, non-spiral, apex directed to the right; aperture very wide; peritreme continuous, simple, entire.

Syn. Angulus, *Mühlf.* Ansulus, *Herrmann.* Ancylastrum, *Bourguignat.*

Ex. A. radiatus, *Guilding*, pl. 84, fig. 5. Shell, A. simplex, *Buc'hoz*, fig. 5, *a*.

The species of this genus are found in running streams, crawling on the stones and feeding on *Ulvæ* and other vegetable productions; they are met with in South America, Southern and Central Europe, the West Indies, and the British Islands.

Species of Ancylus.

aduncus, *Gould.*
Baconii, *Bourg.*
Barilensis, *Moric.*
Beaui, *Bourg.*
Caffer, *Krauss.*
calcareus, *Dekay.*
capuloides, *Jan.*
Charpentierianus, *Bourg.*
compressus, *Nyst.*
concentricus, *D'Orb.*
costulatus, *Küst.*
crassus, *Hald.*
culicoides, *D'Orb.*
Cumingianus, *Bourg.*
cyclostoma, *Bourg.*
deperditus, *Desm.*
depressus, *Hald.*
Deshayesianus, *Bourg.*
diaphanus, *Hald.*
Drouetianus, *Bourg.*
filosus, *Conr.*
fuscus, *C. B. Adams.*
gibbosus, *Bourg.*
Haldemanii, *Bourg.*
Havanensis, *Pfeiff.*
irroratus, *Guild.*
marginatus, *Eichw.*
Moreletii, *Bourg.*
Moricandi, *D'Orb.*
obliquus, *Brod. and Sow.*
obscurus, *Hald.*
obtusus, *Morel.*
Orbignyanus, *Bourg.*
parallelus, *Hald.*
Petitianus, *Bourg.*
pileolus, *Férus.*
radiatilis, *Morel.*
radiatus, *Guild.*
Raymondii, *Bourg.*
riparius, *Desm.*
rivularis, *Say.*
Saulcyanus, *Bourg.*
simplex, *Buc'hoz.*
striatus, *Webb and Berth.*
strictus, *Morel.*
strigatus, *Parr.*
tardus, *Say.*
verruca, *Bens.*
vitraceus, *Morel.*

Genus ACROLOXUS, Beck.

Tongue armed with a central tooth, and twelve lateral teeth on each side, then one tooth of a different form, and lastly six more on each side.

Shell dextral, elongated, oblong, patelliform, non-spiral; apex near the middle, directed to the left.

Syn. Velletia, *Gray.*

Ex. A. lacustris, *Linnæus*, pl. 84, fig. 6. Shell, V. lacustris, fig. 6, *a*.

The *Acroloxi* are dextrorsal *Ancyli;* they differ, moreover, in the form and arrangement of the teeth. They are found adhering to the stems and leaves of aquatic plants in ponds and rivulets.

Species of Acroloxus.

lacustris, *Linn.*
Moquinianus, *Bourg.*
Nuttallii, *Hald.*

Genus LATIA, Gray.

Shell half-ovate, spiral, of one or more rapidly-enlarging whorls; spire short, posteriorly reclined; aperture very large, oblong; basal margin with a thin, narrow, flat, horizontal lamina occupying the hind half of the left side, the left hinder edge bent down and produced into a broad expansion on the right side.

Syn. Pelex, *Gould.*

Ex. L. neritoides, *Gray*, pl. 84, fig. 7.

This genus is from New Zealand, and chiefly differs from *Ancylus* in the transverse septum in the aperture of the shell. The orifice of respiration in the animal is on the right side, the eyes are on the outer base of the tentacles, and there is no operculum.

Genus GUNDLACHIA, Pfeiffer.

Shell thin, ancyliform, non-spiral, obliquely conical; apex inclined backwards, basal side two-thirds closed with a flat, horizontal lamina; aperture anterior, horizontal, semicircular.

Ex. G. ancyliformis, *Pfeiffer*, pl. 84, fig. 8.

This singular, slipper-shaped little shell reminds one in form of *Catillus* or *Crypta*; it is covered with an olivaceous epidermis, and has no operculum. It is an inhabitant of the fresh-water streams of one of the West-Indian Islands.

Sub-order THALASSOPHILA.

Eyes sessile on the front part of the frontal disk formed by the expanded tentacles.

Animal marine, or living in the vicinity of the sea.

Fam. AMPHIBOLIDÆ.

Lingual membrane large, very broad, expanded, and long, with a central space or line scarcely defined; teeth numerous, equal, similar, four-sided, rather longer than broad, in straight cross lines, with a broad, rounded lobe, rather more sinuous on the inner than on the outer side of its front edge. Eyes sessile on the front part of the cephalic disk formed by the expanded tentacles. Respiratory cavity closed, except a small valvular opening on the right side; a large gland occupying the position of the gill. Sexes united.

Operculum horny, oval, sub-spiral.

Shell spiral, globose, umbilicated.

The animals of this family inhabit the salt marshes near the sea, the living shells having *Serpulæ* sometimes attached to them. They appear to respire the free air, the gill being rudimentary, and the mantle-cavity nearly closed. In the armature of the lingual membrane, they approach the *Limnæidæ*, and the form of the frontal disk seems to resemble the head of the same family with the tentacles greatly ex-

panded and united together. The *Amphibolidæ* offer an exception to the general rule, that Pulmonifers with a closed mantle-cavity are destitute of opercula.

Genus AMPHIBOLA, Schumacher.

Shell sub-globose, solid, rugose, umbilicated; spire depressed, whorls angulated; aperture oval; inner lip with a callosity in the middle; columella flattened and reflected; outer lip with a sinus at the hind part.

Syn. Ampullacera, *Quoy*. Thallicera, *Swains*.

Ex. A. nux-avellana, *Chemnitz*, pl. 84, fig. 9. A. (Ampullarina) fragilis, *Quoy and Gaimard*, fig. 9, *a*. Operculum, A. nux-avellana, fig. 9, *b*, 9, *c*. Shell, A. nux-avellana, fig. 9, *d*.

The animals of this genus are found in great abundance in New Zealand, living in pools of brackish water, and, in certain seasons, burying themselves in the sandy mud. The New Zealanders collect them and employ them as articles of food.

Species of Amphibola.

nux-avellana, *Chem.* obovata, *Dkr.*

Sub-gen. AMPULLARINA, Sowerby.

Shell thin, whorls rounded; inner lip simple; outer lip sinuated in the middle.

Busbyi, *Gray.* pomum (Natica), *Phil.*
fragilis, *Quoy and Gaim.*

Fam. SIPHONARIIDÆ.

Lingual membrane broad, rather long; teeth numerous, equal, in slightly-arched, cross lines; the central tooth narrow, elongated, with a small rhombic apex; the lateral teeth larger, diverging, gradually diminishing in size towards the outer side of the series, and furnished with a rather oblique curved tip. Head with a large frontal disk, bi-lobed in front, and formed by the expanded tentacles; eyes sessile on the outer side of the disk. Respiratory orifice covered by a large fleshy lobe of the mantle.

Operculum none.

Shell conical, patelliform, with an internal groove on the right side.

The character of the lingual dentition in this family, which is very similar to that of *Ellobium*, and the closed respiratory cavity, protected, as in *Chilina* and *Ancylus*, by a fleshy lobe of the mantle, seem to indicate this to be the true position of these animals.

Genus SIPHONARIA, Blainville.

Shell limpet-like, orbicular, depressly conical; apex subcentral, oblique, recurved posteriorly; aperture wide, margin irregular, crenulated; muscular impression crescentic; a siphonal groove on the right side, which is extended in a projection beyond the margin.

Syn. Liria, *Gray*. Trimusculus, *Schmidt*.

Ex. S. picta, *D'Orbigny*, pl. 84, fig. 10, 10, *a*. Shell, S. sipho, *Sowerby*, fig. 10, *b*.

The species of *Siphonaria* are marine, being found ad-

hering to rocks between tide-marks; they have a widely-extended geographical range, but are most numerous in the tropics; India, China, Australia, the Philippines, New Zealand, and the Pacific furnish examples of the genus.

Species of Siphonaria.

acuta, *Quoy and Gaim.*
albicans, *Quoy and Gaim.*
aspera, *Krauss.*
atra, *Quoy and Gaim.*
australis, *Quoy and Gaim.*
Capensis, *Quoy and Gaim.*
characteristica, *Reeve.*
Coreënsis, *Adams and Reeve.*
cornuta, *Gould.*
costata, *Sow.*
denticulata, *Quoy and Gaim.*
Diemenensis, *Quoy and Gaim.*
exigua, *Mart.*
gigas, *Sow.*
Guamensis, *Quoy and Gaim.*
inculta, *Gould.*
Javanica, *Lam.*
Jonasii, *Dkr.*
lateralis, *Gould.*
lepida, *Gould.*
leviuscula, *Sow.*
Lessoni, *Blainv.*
lineolata, *Sow.*
maura, *Sow.*
melanozonias, *Gmel.*
Natalensis, *Krauss.*
normalis, *Gould.*
oculus, *Krauss.*
pica, *Sow.*
picta, *D'Orb.*
placentula, *Mke.*
plana, *Quoy and Gaim.*
plicata, *Quoy and Gaim.*
punctata, *Quoy and Gaim.*
Sowerbyi, *H. and A. Adams* (radiata, *Sow.*).
radians, *H. and A. Adams* (radiata, *Adams and Reeve*).
radiata, *Blainv.*
sipho, *Sow.*
striato-costata, *Dkr.*
striatula, *Gmel.*
subrugosa, *Sow.*
umbonata, *Mke.*
variabilis, *Krauss.*
viridis, *Quoy and Gaim.*
Zealandica, *Quoy and Gaim.*

Order OPERCULATA.

Teeth recurved, hooked, in seven rows, arranged in a semi-lunar manner on a narrow lingual band. Mouth proboscidiform, not provided with horny jaws. Respiratory organ reticulate, in the form of a sacciform cavity on the back of the neck; edge of the mantle free from the nape, leaving the respiratory cavity open. Sexes distinct. Operculigerous. Animal oviparous, for the most part terrestrial, and respiring free air.

Dr. Leach appears to have been the first to have pointed out the important differences in organisation which distinguish the operculate division of the *Pulmonifera*. Under the name of *Antrobranchia* he has defined them as being unisexual, and as having reticulated gills. Dr. Gray has more recently shown, that in the armature of their lingual membrane they closely approach the Pectinibranchiate Gasteropods, the teeth greatly resembling those of the *Naticidæ*. The embryonic state of these animals is not well known, but from the circumstance of the eggs being deposited out of the water, it is most probable that the young resemble in form their parent, instead of being provided, as in the Branchiferous Gasteropods, with deciduous cephalic fins, which, in their case, would be superfluous appendages. The great majority of the operculigerous Pulmonifers respire free air by means of their sacciform, lung-like breathing organ. Their tentacles are simply contractile, and not retractile by inversion as in the *Helicidæ*, and their eyes are usually sessile on the head near the bases of the tentacles, instead of being elevated on pedunclcs as in that family. Some of them live on the ground

in humid situations, as the *Cyclophoridæ;* while others again are found near the shore within the influence of the tide, as *Truncatella* and *Paludinella*, or in marshy places, as *Assiminia;* the three latter genera seem to resemble in many essential particulars the family *Littorinidæ*.

Sub-order ECTOPHTHALMA.

Eyes on the side of the head at the outer bases of the tentacles. Foot rather elongate.

Operculum horny or shelly, distinctly spiral, or annulated and non-spiral.

As constituted at present, this division includes but two families, readily distinguished by the nature of the operculum, which in the *Cyclophoridæ* is spiral, and in the *Helicinidæ* is annular.

Fam. CYCLOPHORIDÆ.

Tongue narrow, with seven rows of recurved, hooked teeth. Head proboscidiform; tentacles subulate; eyes on the outer side of the bases of the tentacles. Foot elongated.

Operculum distinctly spiral, testaceous, cartilaginous or horny; whorls very numerous and sub-equal, or few and rapidly-increasing.

Shell usually covered with a horny epidermis; aperture, for the most part, circular.

The animals of this extensive family are found in the humid parts of tropical forests, either concealed among the débris at the roots of trees, or inhabiting the branches and the foliage; they are also met with in dry and arid situa-

tions, and among loose stones and leaves in chalky and barren regions, while some take up their abode in the immediate vicinity of the sea. The structure of the operculum, which varies in different typical forms, presents peculiarities which afford valuable aids in our endeavours to group the species; the shells are usually turbinate, and are generally covered with an epidermis, which is often mottled and variegated with a reddish brown colour. As in the *Helicidæ*, the spiral cone which forms the shell assumes very varied proportions, being sometimes planorbular and depressed, as in *Cyclotus*, pupiform and elevated, as in *Megalomastoma*, or heliciform and moderate, as in *Cyclophorus*.

Sub-fam. CYCLOTINÆ.

Operculum thick, formed of two laminæ with a groove on the edge between them; the inner layer horny, the outer calcareous; orbicular, of many gradually-enlarging whorls, usually with a raised border on their outer edge forming a spiral ridge or fringe; nucleus central.

Genus CYCLOTUS, Guilding.

Operculum orbicular, testaceous, arctispiral, rather concave externally, the whorls with the margins thickened and elevated, nucleus sub-central.

Shell discoidal or turbinately depressed, widely umbilicated; aperture entire, circular; peristome simple or double, straight, expanded or reflexed.

Syn. Poteria, *Gray*. Myxostomella, *Gray*.

Ex. C. semistriatus, *Sowerby*, pl. 85, fig. 1. Oper

culum, C. Inca, *D'Orbigny*, fig. 1, *a*, 1, *b*. Shell, C. semistriatus, fig. 1, *c*.

The majority of the species of *Cyclotus* proper are inhabitants of the East-Indian and Philippine Archipelagoes, while a few are from New Guinea and the Fiji Islands. The sub-genus *Cyrtotoma* is from Mexico; the sub-genus *Aperostoma* is geographically distributed into two groups, one from South America, and the other from the West Indies, especially from the Island of Jamaica; not a single species appears to inhabit the Old World.

Species of Cyclotus.

conoideus, *Pfeiff.*
corniculum, *Mouss.*
diatretus, *Gould.*
discoideus, *Sow.*
exiguus, *Sow.*
filocinctus, *Bens.*
Fortunei, *Pfeiff.*
hebraicus, *Less.*
incomptus, *Sow.*
mucronatus, *Sow.*
opalinus, *Mouss.*
orbellus, *Lam.*
planorbulus, *Lam.*
plebejus, *Sow.*
pusillus, *Sow.*
Recluzianus, *Pfeiff.*
scalaris, *Pfeiff.*
subdiscoideus, *Sow.*
substriatus, *Sow.*
variegatus, *Swains.*
volvuloides, *Sow.*

Sub-gen. APEROSTOMA, Troschel (Cyclopoma, *Trosch.*).

Operculum with the margin of the whorls elevated into an incurved lamina.

Shell with the peritreme simple, continuous, acute.

asperulus, *Sow.*
cingulatus, *Sow.*
corrugatus, *Sow.*
crassus, *C. B. Adams.*
disjunctus, *Morie.*
distinctus, *Sow.*
dubiosus, *C. B. Adams.*
Duffianus, *C. B. Adams.*
giganteus, *Gray.*
Inca, *D'Orb.*

Jamaicensis, *Chem.*
jugosus, *C. B. Adams.*
laxatus, *Sow.*
pallescens, *C. B. Adams.*
perpallidus, *C. B. Adams.*
Popayanus, *Lea.*
prominulus, *Férus.*
Quitensis, *Pfeiff.*
seminudus, *C. B. Adams.*
semistriatus, *Sow.*
stramineus, *Reeve.*
subrugosus, *Sow.*
suturalis, *Sow.*
translucidus, *Sow.*
varians, *C. B. Adams.*

Sub-gen. CYRTOTOMA, Mörch.

Shell with the last whorl free, cylindrical; peristome with the left margin entirely free, deeply emarginate at the umbilicus, dilated and expanded below the emargination.

Mexicanus, *Menke.*

Genus OPISTHOPORUS, Benson.

Operculum calcareous, circular, thick, multispiral, concave on both sides, composed of an internal horny, and an external calcareous layer, with an erect, spiral lamina between them, nucleus central, margin concave.

Shell depressed, orbicular, widely umbilicated, the suture furnished, near the aperture, with an exserted, pervious tube; aperture circular; peristome double, the external expanded and produced superiorly into a tectiform beak, the internal sometimes emarginate above or shortly excised.

Syn. Cœlopoma, *Benson.*

Ex. O. biciliatus, *Mousson*, pl. 85, fig. 2. Operculum, O. biciliatus, fig. 2, *a*, 2, *b*, 2, *c*.

The species of this group, which is readily distinguished from *Pterocyclos* by the operculum being flat, and from *Myxostoma* by the operculum being complex and calcareous,

instead of simple and horny, are from the Islands of the Eastern Archipelago, principally from Borneo and Java.

Species of Opisthoporus.

biciliatus, *Mouss.*
rostellatus, *Pfeiff.*
tubuliferus, *Pfeiff.*

Genus PTEROCYCLOS, Benson.

Operculum convex, elevated, multispiral, deeply concave internally, composed of a calcareous spiral lamina covered with a horny layer.

Shell sub-discoidal, widely umbilicated; aperture circular; peristome double, the external dilated superiorly into a wing or tectiform beak, the internal short and incised on the right margin.

Syn. Steganostoma, *Troschel.*

Ex. P. rupestris, *Benson*, pl. 85, fig. 3. Operculum, P. rupestris, fig. 3, *a*, 3, *b*, 3, *c*.

The species of this genus inhabit India and the Islands of the East-Indian Archipelago, Ceylon, and Cochin-China. The shells have the same tectiform canaliculate wing seen in *Myxostoma* and *Opisthoporus*, but the structure of the operculum will distinguish them.

Species of Pterocyclos.

Albersi, *Pfeiff.*
anguliferus, *Soul.*
bilabiatus, *Bens.*
Blandi, *Bens.*
Cumingi, *Pfeiff.*
nanus, *Bens.*
parvus, *Pears.*
rupestris, *Bens.*
tenuilabiatus, *Metcalfe.*
Troscheli, *Bens.*

Sub-gen. SPIRACULUM, Pearson.

Shell with a reverted, closed tube or spiracle, situated on the suture near the aperture.

hispidus, *Pearson.*

Genus ALYCÆUS, Gray.

Operculum circular, sub-testaceous, obsoletely many-whorled.

Shell conical or depressed; spire regular, suture deep, with a retroversal callus, last whorl distorted, compressed and contracted behind the aperture; aperture circular, peristome regularly reflexed.

Ex. A. gibbus, *Férussac*, pl. 85, fig. 4. Operculum, A. gibbus, fig. 4, *a*, 4, *b*.

The head-quarters of this small but peculiar group appear to be India, three species being found in the Sikkim Himalaya; the *A. gibbus* is from Cochin-China, and *A. spiracellum* is from the Island of Borneo.

Species of Alycæus.

constrictus, *Benson.*
gibbus, *Férus.*
spiracellum, *Adams and Reeve.*
strangulatus, *Hutton.*
urnula, *Benson.*

Sub-fam. CYCLOPHORINÆ.

Operculum horny, thin, without any external shelly layer; orbicular, of many very gradually-enlarging whorls; nucleus central.

Shell conical or depressed, last whorl rounded, without any groove or ridge round the front of the axis.

Genus CYCLOPHORUS, Montfort.

Operculum orbicular, horny, thin, more or less concave externally, with numerous narrow whorls, and a central nucleus.

Shell globosely turbinated, depressed or discoidal, usually widely umbilicated; aperture circular; peristome continuous, straight or expanded.

Syn. Annularia, *Schum.* Cyclophora, *Swains.* Cyclohelix, *Mörch.*

Ex. C. tigrinus, *Sowerby*, pl. 85, fig. 5. Operculum, C. tigrinus, fig. 5, *a*, 5, *b*. Shell, C. involvulus, *Müller*, fig. 5, *c*.

The greater number of this group are inhabitants of the continent of India, the East-Indian Islands, Ceylon, and the Philippines; a few are from Madagascar; a section with the peristome straight is from the Pacific Islands; and another section is from South America.

Species of Cyclophorus.

alternans, *Pfeiff.*
altivagus, *Bens.*
Amboinensis, *Pfeiff.*
amœnus, *Pfeiff.*
Apiæ, *Recluz.*
appendiculatus, *Pfeiff.*
annulatus, *Trosch.*
aquila, *Sow.*
atramentarius, *Sow.*
Aurora, *Bens.*
Bairdi, *Pfeiff.*
Bensoni, *Pfeiff.*
Birmanus, *Pfeiff.*
Borneensis, *Metcalfe.*
Bourcieri, *Pfeiff.*
canaliferus, *Sow.*
Cantori, *Bens.*
Cayennensis, *Shuttl.*
Ceylanicus, *Pfeiff.*
Charpentieri, *Mouss.*

cœloconus, *Bens.*
Cumingii, *Sow.*
Cytora, *Gray.*
densilineatus, *Pfeiff.*
disculus, *Pfeiff.*
Dysoni, *Pfeiff.*
euomphalus, *Pfeiff.*
eximius, *Mouss.*
expansus, *Pfeiff.*
exul, *Bens.*
flavus, *Brod.*
fornicatus, *Pfeiff.*
fulguratus, *Pfeiff.*
Guimarasensis, *Sow.*
guttatus, *Pfeiff.*
Himalayanus, *Pfeiff.*
Ibyatensis, *Pfeiff.*
ictericus, *Sow.*
Indicus, *Desh.*
involvulus, *Müll.*
Jerdoni, *Bens.*
labiosus, *Pfeiff.*
leucostomus, *Pfeiff.*
linguiferus, *Sow.*
lingulatus, *Sow.*
loxostomus, *Pfeiff.*
luridus, *Pfeiff.*
lutescens, *Pfeiff.*
maculosus, *Sow.*
margarita, *Pfeiff.*
marmoratus, *Férus.*
Menkeanus, *Phil.*
milium, *Bens.*
obliquatus, *Gould.*
oculus-capri, *Wood.*
parapsis, *Bens.*
parvus, *Sow.*
Pearsoni, *Bens.*
perdix, *Brod. and Sow.*
phænotopicus, *Bens.*
Philippinarum, *Sow.*
picturatus, *Pfeiff.*
Pirrieanus, *Pfeiff.*
ponderosus, *Pfeiff.*
porphyriticus, *Bens.*
psilomitus, *Pfeiff.*
punctatus, *Gratel.*
purus, *Forbes.*
pyrotrema, *Bens.*
ravidus, *Bens.*
rufescens, *Sow.*
semisulcatus, *Sow.*
Siamensis, *Sow.*
speciosus, *Phil.*
stenomphalus, *Pfeiff.*
stenostomus, *Sow.*
striatulus, *Pfeiff.*
strigatus, *Gould.*
tenebricosus, *Adams and Reeve.*
texturatus, *Sow.*
Thersites, *Shuttl.*
tiara, *Gould.*
tigrinus, *Sow.*
triliratus, *Pfeiff.*
trochoides, *Yoldi.*
tryblium, *Bens.*
tuba, *Sow.*
turbinatus, *Pfeiff.*
turbo, *Chem.*
turgidus, *Pfeiff.*
validus, *Sow.*
volvulus, *Müll.*
Wahlbergi, *Bens.*
Woodianus, *Lea.*
zebra, *Gratel.*
zebrinus, *Bens.*
Zollingeri, *Mouss.*

Sub-gen. MYXOSTOMA, Troschel (Lituus, *Martyn*, not *Browne*).

Operculum flat, thick, sub-cartilaginous.

Shell with the inner peristome continuous and entire, the outer reflexed, with a beak behind closely pressed to the last whorl.

brevis, *Martyn*.

Genus LEPTOPOMA, Pfeiffer.

Operculum circular, membranous, narrowly whorled, flat.

Shell globosely turbinated or conical, narrowly umbilicated; peristome simple, reflexed, margins wide apart, sometimes united by a very thin callus.

Ex. L. immaculatum, *Chemnitz*, pl. 85, fig. 6. Operculum, L. perlucidum, *Grateloup*, fig. 6, *a*, 6, *b*. Shell, L. immaculatum, fig. 6, *c*.

Nearly all the species of this genus are from New Guinea, Borneo, and the Philippine Islands; one small species is from Pitcairn's Island; and one or two are from Ceylon.

Species of Leptopoma.

acuminatum, *Sow.*
acutimarginatum, *Sow.*
atricapillum, *Sow.*
bicolor, *Pfeiff.*
ciliatum, *Sow.*
ciliferum, *Mouss.*
elatum, *Pfeiff.*
fibula, *Sow.*
goniostoma, *Sow.*
halophilum, *Bens.*
helicoides, *Grat.*
ignescens, *Pfeiff.*
immaculatum, *Chem.*
insigne, *Sow.*
latelimbatum, *Pfeiff.*
luteostoma, *Sow.*
Massenæ, *Less.*
melanostoma, *Petit.*
Panayense, *Sow.*
perlucidum, *Grat.*
perplexum, *Sow.*
pileus, *Sow.*
regulare, *Pfeiff.*
sericatum, *Pfeiff.*
undatum, *Metcalfe.*

Genus DERMATOCERA, H. and A. Adams.

Animal with a conical, epidermal horn on the hind part of the foot.

Operculum orbicular, membranous, flat, with many narrow whorls and a central nucleus.

Shell globosely turbinate, narrowly umbilicated, whorls rounded, simple; peristome reflexed, with the margins wide apart and united by a thin callus.

Syn. Cyclostoma sp., *Sow.* Leptopoma sp., *Pfeiff.*

Ex. D. vitrea, *Lesson*, pl. 85, fig. 7. Operculum, D. vitrea, fig. 7, *a*, 7, *b*. Shell, D. vitrea, fig. 7, *c*.

M. Eydoux has figured a *Cyclostomus* with a similar caudal appendage in the "Voyage of the Bonite." Although there does not appear to be any great difference either in the shell or operculum of the animal on which we have established this genus, still the existence of a conspicuous, fleshy, horn-like appendage on the hind part of the foot appears of a nature so peculiar as to warrant us in giving a name to those animals in which it is present. The species we have examined, and which is in spirits in Mr. Cuming's Collection, is from the Islands of the Philippine Archipelago.

Species of Dermatocera.

maculosa, *Eyd and Soul.* vitrea, *Less.*

Genus AULOPOMA, Troschel.

Operculum horny, arctispiral, planorbiform, composed of two laminæ, the last whorl furnished internally with a cir-

cular groove, the outer edge larger than the aperture, and reflexed over the peristome of the shell.

Shell turbinate, depressed or sub-discoidal, the last whorl anteriorly detached; peristome free, straight, continuous, received into the circular groove of the operculum.

Ex. A. cornu-venatorium, *Sowerby*, pl. 85, fig. 8. Operculum, A. cornu-venatorium, fig. 8, *a*, 8, *b*.

The few species known are from the Island of Ceylon.

Species of Aulopoma.

cornu-venatorium, *Sow.*
helicinum, *Chem.*
Itierii, *Guer.*

Genus CRASPEDOPOMA, Pfeiffer.

Operculum horny, solid, whorls very narrow, nucleus central, outer lamina flat, inner concave and furnished with a circular marginal prominence.

Shell sub-turbinate, rimate, axis imperforate, last whorl slightly produced, straight; aperture circular, rather contracted; peristome continuous, simple, receiving the external prominence of the operculum.

Syn. Bolania, *Gray*. Hygrobium, *Lowe*.

Ex. C. lucidum, *Lowe*, pl. 85, fig. 9. Operculum, C. lucidum, fig. 9, *a*, 9, *b*, 9, *c*.

The few species at present known are from the Island of Madeira.

Species of Craspedopoma.

costatum, *Shuttl.*
lucidum, *Lowe.*
Lyonnetianum, *Lowe.*

Sub-fam. PUPININÆ.

Operculum horny, thin, orbicular, of many very gradually-enlarging whorls; nucleus central.

Shell oblong-elongate, last whorl with a fold or spiral ridge on the inner side, in front of the axis, sometimes forming a groove in the outer lip.

Genus MEGALOMASTOMA, Guilding.

Operculum horny, thin, sub-circular, closely-whorled, flat.

Shell scarcely perforated, cylindrical or pupiform, covered with a thin epidermis, last whorl with a slight ridge round the umbilical region; aperture circular; peristome continuous, double, expanded and thickened, the columellar margin sometimes slightly notched.

Syn. Farcimen, *Trosch.* Megaloma, *Woodw.* Lomastoma, *Woodw.*, not *Rafin.*

Ex. M. altum, *Sowerby*, pl. 86, fig. 1. Operculum, M. altum, fig. 1, *a*, 1, *b*. Shell, M. altum, fig. 1, *c*.

Although the West-Indian Islands seem to be the head-quarters of this genus, most of the species being natives of Cuba, Haiti, and St. Vincent, one example, *M. sectilabrum*, Gould, is found in Tavoy, another, *M. pauperculum*, Sow., in Assam, and a third, *M. funiculatum*, Benson, in the Eastern Himalaya.

Species of Megalomastoma.

altum, *Sow.*
alutaceum, *Mke.*
Antillarum, *Sow.*
auriculatum, *D'Orb.*
bifasciatum, *Sow.*
bituberculatum, *Sow.*
chrysalis, *Pfeiff.*
croceum, *Sow.*

cylindraceum, *Chem.*
Guatemalense, *Pfeiff.*
Guildingianum, *Pfeiff.*
Mani, *Poey.*
Orbignyi, *Pfeiff.*
pauperculum, *Sow.*
sectilabrum, *Gould.*
simulacrum, *Morel.*
tortum, *Wood.*
ventricosum, *D'Orb.*

Genus TORTULOSA, Gray.

Operculum orbicular, flat, horny, many-whorled.

Shell perforate, pupa-shaped, not callous, last whorl furnished with a filiform, basal keel; aperture circular, entire, prolonged at the base by a somewhat circular channel; peristome continuous, dilated at its lower extremity into the keel of the last whorl.

Syn. Cataulus, *Pfeiffer.*

Ex. T. tortuosa, *Chemnitz*, pl. 86, fig. 2. Operculum, T. pyramidata, *Pfeiffer*, fig. 2, *a*, 2, *b*.

This group, first indicated and named by Gray, and afterwards described by Pfeiffer, seems to represent in Ceylon the *Megalomastoma* of Guilding, which is principally limited to the West-Indian Islands. The whorls of the operculum, when macerated, separate, and may be unrolled in a spiral form.

Species of Tortulosa.

Austeniana, *Bens.*
decora, *Bens.*
eurytrema, *Pfeiff.*
Layardi, *Gray.*
marginata, *Pfeiff.*
pyramidata, *Pfeiff.*
Templemani, *Pfeiff.*
Thwaitesi, *Pfeiff.*
tortuosa, *Chem.*

Genus ANAULUS, Pfeiffer.

Shell pupiform, umbilicated, covered with a thin, horny epidermis; whorls gibbous, longitudinally very finely ribbed; aperture circular; peristome continuous, double, the inner straight and slightly notched posteriorly, the outer reflexed, entire in front, and with a tubular opening or spiraculum at the suture.

Ex. A. bombycinus, *Pfeiffer*, pl. 86, fig. 3.

The shell, on which this genus is established, is from Sarāwak, in the Island of Borneo, and is remarkable for the tubular canal round the suture and which opens on the peritreme, at the upper margin.

Genus PUPINELLA, Gray.

Operculum horny, orbicular, multispiral.

Shell ovate, covered with a thin, horny epidermis; aperture circular; peristome reflexed, thickened, with a groove on the inner side of the front near the axis; columellar margin of peristome posteriorly canaliculated, and with another canal at the insertion of the right edge.

Ex. P. pupiniformis, *Sowerby*, pl. 86, fig. 4. Operculum, P. grandis, *Forbes*, fig. 4, *a*, 4, *b*.

Several species are known from the Islands of Luzon and Mindoro, and from the Louisiad Archipelago.

Species of Pupinella.

grandis, *Forbes.*
humilis, *Jacq.*
Mindorensis, *Adams and Reeve.*
pupiniformis, *Sow.*

Genus DIPLOMMATINA, Benson.

Tentacles long and filiform; eyes sessile on their posterior part at the base. Foot short.

Operculum thin, shelly; whorls few, with thin prominent lamellæ on their external edges.

Shell thin, sub-ovate, whorls convex, the last sub-ascendent; aperture sub-circular; inner lip with a spiral fold; peristome double; outer lip expanded.

Ex. D. folliculus, *Pfeiffer*, pl. 86, fig. 5. Operculum, D. folliculus, fig. 5, *a*, 5, *b*.

Mr. Benson, in his account of this genus, mentions a peculiarity of the eyes, from which he has derived the generic name. These organs are situated on the hind part of the tentacles at their base, and are composed of two lobes, one lobe deeply seated in the tentacle and larger than the other lobe, which is a small black point coming to the surface on the outer side of the larger lobe. The species abound in masses of decayed, fallen leaves, and under stones in damp situations beneath trees, on the shady sides of the mountains at Simla, Mussoorie, and Landour of the Himalaya; the sub-genus *Paxillus*, founded on a smooth, reversed species, is from the Island of Borneo.

Species of Diplommatina.

Bensoni, *A. Adams*.
Cantori, *Pfeiff.*
capillacea, *Pfeiff.*
costulata, *Bens.*
folliculus, *Pfeiff.*
Huttoni, *Pfeiff.*
Macgillivrayi, *Pfeiff.*
minor, *A. Adams*.

Sub-gen. PAXILLUS, H. and A. Adams.

Operculum —?

Shell pupiform, rimate, smooth; spire acuminated; aperture semi-ovate, ascending on the body-whorl; inner lip adnate, spreading, flexuous, with a prominent tooth-like fold in the middle; outer lip double, emarginate anteriorly; umbilical region with a spiral elevated ridge ending in a notch at the fore part of the aperture.

adversa, *H. and A. Adams.*

Sub-gen. ARINIA, H. and A. Adams.

Operculum thin, shelly, whorls few, with prominent lamellæ on their external edges.

Shell sub-imperforate, thin, smooth, shining; spire ovate, apex blunt, whorls inflated, the penultimate the broadest; aperture nearly circular; peristome shortly expanded, the margins almost contiguous, columellar margin angularly dilated in the middle.

minus (Cyclostoma), *Sow.*

Genus PUPINA, Vignard.

Operculum thin, membranous, narrow-whorled, rather flat.

Shell pupiform, covered by a smooth, shining callus; peristome simple, thickened or reflexed, the columellar margin with a transverse canal in the middle, and another canal at the insertion of the right margin.

Ex. P. bicanaliculata, *Sowerby*, pl. 86, fig. 6. Operculum, P. bicanaliculata, fig. 6, *a*, 6, *b*.

One species is from eastern Australia, two are from New Ireland, and one is from the Philippines.

Species of Pupina.

aurea, *Hinds.*
bicanaliculata, *Sow.*
bilinguis, *Pfeiff.*
Cumingii, *Pfeiff.*
Keraudrenii, *Vign.*
Thompsoni, *Forbes.*

Genus REGISTOMA, Hasselt.

Operculum circular, thin, membranaceous, flat, closely-whorled.

Shell oval, polished, covered with a smooth callus; whorls rather distorted, large, flattened; aperture circular; peristome reflexed, inner lip thin, with a slight notch on the inner side near the axis.

Syn. Rhegostoma, *Agassiz.* Rhexistoma, *Herrm.* Moulinsia, *Gratel.*

Ex. R. grande, *Gray*, pl. 86, fig. 7. Operculum, R. fuscum, *Gray*, fig. 7, *a*, 7, *b*.

A small, well-marked group, nearly all from the Islands of the Philippine Archipelago.

Species of Registoma.

Cumingianum, *Pfeiff.*
exiguum, *Sow.*
fuscum, *Gray.*
grande, *Gray.*
Nicobaricum, *Pfeiff.*
pellucidum, *Sow.*
simile, *Sow.*

Genus CALLIA, Gray.

Operculum thin, membranous, narrow-whorled.

Shell pupiform, covered with a smooth, shining callus; peristome sub-continuous, straight, scarcely thickened, columellar margin entire above, appressed, reflexed, in the young altogether closing the perforation.

Ex. C. lubrica, *Sowerby*, pl. 86, fig. 8. Operculum, C. lubrica, fig. 8, *a*, 8, *b*.

A single species only is known, from the Philippine Islands.

Sub-fam. CYCLOSTOMINÆ.

Operculum thick, solid, with a more or less thickened, external, shelly coat, ovate, rarely sub-circular, composed of a few gradually-increasing whorls; nucleus somewhat excentrical.

Genus CYCLOSTOMUS, Montfort.

Operculum shelly, few-whorled, whorls flat, the last broad; nucleus excentric.

Shell globoso-conical, or conical-turreted, thin, axis open, simple; peristome simple or double, continuous, straight or expanded.

Syn. Cyclostoma, *Lam.* Ericia, *Partiot.*

Ex. C. elegans, *Müller*, pl. 86, fig. 9. Operculum, C. elegans, fig. 9, *a*, 9, *b*. Shell, C. elegans, fig. 9, *c*.

Algeria, the West Indies, the Canary Islands, and Europe, harbour the majority of this genus, as restricted, one species, *C. elegans*, forming the only representative of the family *Cyclophoridæ* in the British Islands. The sub-genus *Tro-*

pidophora is an African group, being found in Zanzibar, Natal, Madagascar, Seychelles, and the Isle of France; *Lithidion* is a peculiar group from Arabia, Socotara, and Madagascar; the sub-genus *Otopoma* is also from Arabia, Socotara, Yemen, Mogadoxa, the Mauritius, and Madagascar; while of *Leonia*, in which the operculum is convex and composed of but one whorl, a single species only is known, from Spain and Algeria.

Species of Cyclostomus.

albus, *Pfeiff.*
aplustris, *Sow.*
asper, *Pot. and Mich.*
Banksianus, *Sow.*
Bronnii, *C. B. Adams.*
Carolinensis, *Pfeiff.*
Chevalieri, *C. B. Adams.*
citrinus, *Sow.*
concinnus, *Sow.*
costulatus, *Ziegl.*
dissectus, *Sow.*
Dominicensis, *Pfeiff.*
elegans, *Müll.*
euchilus, *Pfeiff.*
fascicularis, *Pfeiff.*
fimbriatus, *Lam.*
fulvescens, *Sow.*
glaucus, *Sow.*
Goudotianus, *Sow.*
gratus, *Petit.*
griseus, *Pfeiff.*
Humphreysianus, *Pfeiff.*
insularis, *Pfeiff.*
Jayanus, *C. B. Adams.*
lamellosus, *C. B. Adams.*
lævigatus, *Webb and Berth.*
ligatus, *Müll.*
ligulatus, *Gratel.*
lineatus, *Pfeiff.*
multifasciatus, *Gratel.*
Novæ Hiberniæ, *Quoy.*
obsoletus, *Lam.*
pyrostoma, *Sow.*
Rangelinus, *Poey.*
reticulatus, *Adams and Reeve.*
retrorsus, *C. B. Adams.*
rugulosus, *C. B. Adams.*
saccatus, *Pfeiff.*
salebrosus, *Morel.*
Sowerbyi, *Pfeiff.*
striatulus, *Pfeiff.*
subliratus, *Pfeiff.*
sulcatus, *Drap.*
sulculosus, *Férus.*
tectilabris, *C. B. Adams.*
tenuis, *Sow.*
tersus, *Bens.*
thysanoraphe, *Sow.*
virgatus, *Sow.*
Wilkinsonii, *C. B. Adams.*
xanthochilus, *Sow.*
Yallahensis, *C. B. Adams.*
Zanguebaricus, *Petit.*
zonatus, *Petit.*

Sub-gen. TROPIDOPHORA, Troschel.

Shell depressed or elevately turbinated, generally acutely keeled, or strongly striated; peristome simple, sub-continuous, reflexed, often partially covering the axis.

Abeillei, *Gratel.*
articulatus, *Gray.*
Barclayanus, *Pfeiff.*
bicarinatus, *Sow.*
calcareus, *Sow.*
campanulatus, *Pfeiff.*
carinatus, *Born.*
cariniferus, *Sow.*
castaneus, *Pfeiff.*
Creplini, *Dkr.*
Cuvierianus, *Petit.*
deliciosus, *Férus.*
Deshayesianus, *Petit.*
formosus, *Sow.*
fusculus, *Pfeiff.*
Kraussianus, *Pfeiff.*
liratus, *Pfeiff.*
Madagascariensis, *Gray.*
Michaudi, *Gratel.*
modestus, *Petit.*
Moulinsii, *Sow.*
pulchellus, *Sow.*
pulcher, *Gray.*
rugosus, *Lam.*
tricarinatus, *Müll.*
trochlea, *Bens.*
unicarinatus, *Lam.*
unicolor, *Pfeiff.*
vittatus, *Sow.*
zonulatus, *Sow.*

Sub-gen. LITHIDION, Gray.

Operculum sub-orbicular, with a strong, convex, sub-central keel and simple edge.

Shell depressed, widely umbilicated; aperture circular; peristome simple.

depressus, *Sow.*
desciscens, *Pfeiff.*
niveus, *Petit.*
Souleytianus, *Pfeiff.*
sulcatus, *Gray.*

Sub-gen. OTOPOMA, Gray.

Shell conico-globose or depressed, solid, umbilicated; aperture sub-oval; peristome straight or sub-reflexed, columellar margin generally dilated, more or less covering the umbilicus.

albicans, *Sow.*
auricularis, *Gray.*

clathratulus, *Recluz.*
clausus, *Sow.*
Guillaini, *Petit.*
hæmastoma, *Anton.*
Listeri, *Gray.*
multilineatus, *Jay.*
naticoides, *Recluz.*
Philippianus, *Pfeiff.*
politus, *Sow.*
pygmæus, *Sow.*
spurcus, *Gratel.*
unifasciatus, *Sow.*
vitellinus, *Pfeiff.*

Sub-gen. LEONIA, Gray.

Operculum externally very convex, composed of a single whorl; nucleus placed near the columellar margin.

Shell ovate, conical; aperture oval; peristome simple, slightly reflexed.

mamillaris, *Lam.*

Genus CISTULA, Humphrey.

Operculum ovate, thin, cartilaginous, with a very thin, external, shelly coat; whorls few, gradually-enlarging, flat, their edges simple, generally free, centre rather concave; nucleus excentric.

Shell globosely conical or ovate, or oblongly turreted, generally truncated; aperture oval or sub-circular; peristome double, or simple and expanded.

Ex. C. catenata, *Gould*, pl. 86, fig. 10. Operculum, C. catenata, fig. 10, *a*, 10, *b*.

With scarcely a single exception, this group is from the West Indies and South or Central America, most of the species coming from Cuba and Jamaica.

Species of Cistula.

Agassizii, *Charp.*
ambigua, *Lam.*
bilabiata, *D'Orb.*
bilabris, *Mke.*

Campbellii, *C. B. Adams.*
Candeana, *D'Orb.*
catenata, *Gould.*
cinclidodes, *Pfeiff.*
confusa, *Pfeiff.*
dislocata, *Baird.*
fallax, *Pfeiff.*
fascia, *Wood.*
Grateloupi, *Pfeiff.*
Griffithiana, *C. B. Adams.*
Gruneri, *Pfeiff.*
Küsteri, *Pfeiff.*
Largillierti, *Phil.*
limbifera, *Mke.*
lineolata, *Lam.*
lugubris, *Pfeiff.*
mordax, *C. B. Adams.*
pallida, *Pfeiff.*
pauperata, *C. B. Adams.*
platychila, *Pfeiff.*
pleurophora, *Pfeiff.*
radiosa, *Morel.*
radula, *Pfeiff.*
rigidula, *Morel.*
rostrata, *Pfeiff.*
Rüsei, *Pfeiff.*
sagittifera, *C. B. Adams.*
Sauliæ, *Sow.*
scabrosa, *Humph.*
sericina, *C. B. Adams.*
Sheppardiana, *C. B. Adams.*
Tamsiana, *Pfeiff.*
Thoreyana, *Phil.*
trochlearis, *Pfeiff.*

Sub-gen. TUDORA, Gray.

Shell ovate-oblong or turreted; aperture angulately oval; peristome expanded, simple or double.

Adamsi, *Pfeiff.*
armata, *C. B. Adams.*
Augustæ, *C. B. Adams.*
avena, *C. B. Adams.*
canescens, *Pfeiff.*
Chemnitzii, *Wood.*
columna, *Wood.*
costata, *Mke.*
cremilosa, *C. B. Adams.*
fecunda, *C. B. Adams.*
ferruginea, *Lam.*
maritima, *C. B. Adams.*
megacheila, *Pot. and Mich.*
Moreletiana, *Petit.*
mutica, *C. B. Adams.*
nobilis, *Pfeiff.*
ovata, *Pfeiff.*
pupæformis, *Sow.*
pupoides, *Morel.*
quaternata, *Lam.*
simulans, *C. B. Adams.*
Tappaniana, *C. B. Adams.*
versicolor, *Pfeiff.*
violacea, *Pfeiff.*

Genus CHONDROPOMA, Pfeiffer.

Operculum oval, sub-cartilaginous, flat, whorls few, rapidly increasing; nucleus generally very excentric.

Shell oblong-turreted, often truncated, rarely, globosely-turbinated; aperture oval; peristome simple, or more or less double, somewhat straight, rather expanded or broadly reflexed.

Ex. C. semilabre, *Lamarck*, pl. 86, fig. 11. Operculum, C. semilabre, fig. 11, *a*, 11, *b*.

Chiefly from the West-Indian Islands, Jamaica, Cuba, Haiti; Honduras, Florida, and Mexico Except in the operculum not being testaceous, this group does not seem to differ very materially from *Cistula*.

Species of Chondropoma.

blandum, *Pfeiff.*
crenulatum, *Férus.*
Cumanense, *Pfeiff.*
Delatreanum, *D'Orb.*
dentatum, *Say.*
diaphanum, *Pfeiff.*
elongatum, *Wood.*
eusarcum, *Pfeiff.*
harpa, *Pfeiff.*
hemiotum, *Pfeiff.*
integrum, *Pfeiff.*
irradians, *Shuttl.*
jucundum, *Pfeiff.*
latilabre, *D'Orb.*
litturatum, *Pfeiff.*
Loweanum, *Pfeiff.*
magnificum, *Sallé.*
Newcombianum, *C. B. Adams.*
obesum, *Mke.*
Ottonis, *Pfeiff.*
papyraceum, *C. B. Adams.*
Petitianum, *Pfeiff.*
pictum, *Pfeiff.*
plicatulum, *Pfeiff.*
Poëyanum, *D'Orb.*
rubicundum, *Morel.*
Salleanum, *Pfeiff.*
semicanum, *Morel.*
semilabre, *Lam.*
sericatum, *Morel.*
Shuttleworthi, *Pfeiff.*
simplex, *Pfeiff.*
tenebrosum, *Morel.*

truncatum, *Wiegm.*
turritum, *Pfeiff.*
Venezuelense, *Pfeiff.*
vespertinum, *Morel.*

Genus CHOANOPOMA, Pfeiffer.

Operculum testaceous, sub-circular, with gradually-enlarging whorls, their outer margins free, acute, often elevated into prominent, thin lamellæ; nucleus sub-excentric.

Shell globosely turbinate or turreted, often truncated, rarely, depressed; aperture sub-oval or circular; peristome usually double, the internal continuous, circular, the external rectangular, expanded.

Syn. Gastrodonia, *Partiot.*

Ex. C. scabriculum, *Sowerby*, pl. 86, fig. 12. Operculum, C. scabriculum, fig. 12, *a*, 12, *b*. Shell, C. fimbriatulum, *Sowerby*, fig. 12, *c*.

A group of beautiful shells, entirely West Indian in their geographical distribution, and principally from the Island of Jamaica.

Species of Choanopoma.

Adolfi, *Pfeiff.*
alatum, *Pfeiff.*
Chittyi, *C. B. Adams.*
decussatum, *Lam.*
fimbriatulum, *Sow.*
granosum, *C. B. Adams.*
Hillianum, *C. B. Adams.*
interruptum, *Lam.*
lima, *C. B. Adams.*
lincinellum, *C. B. Adams.*
mactum, *Poey.*
mite, *Pfeiff.*
pisum, *C. B. Adams.*
Pretrei, *D'Orb.*
pudicum, *D'Orb.*
pulchrum, *Wood.*
scabriculum, *Sow.*
solutum, *Rich.*
spinulosum, *C. B. Adams.*
tentorium, *Pfeiff.*

Sub-gen. LICINA, Browne.

Shell conical, the last whorl produced out of the spiral line, straight; peristome sub-reflexed, expanded.

evolutum, *Reeve.*
labeo, *Müll.*
lincina, *Born.*
Reevianum, *Pfeiff.*

Sub-gen. JAMAICIA, C. B. Adams.

Operculum externally convex, whorls few, rather rugose, obliquely striated, sub-lamellar.

Shell umbilicated, globose-conical; aperture circular; peristome simple, straight, or reflexed.

anomalum, *C. B. Adams.*
Moussonianum, *C. B. Adams.*

Genus ADAMSIELLA, Pfeiffer.

Operculum circular, thin, sub-cartilaginous, whorls few, gradually-enlarging, with the margins somewhat free; nucleus central.

Shell pupiform or oblong-turreted; aperture rather small, sub-circular; peristome generally double, more or less expanded or reflexed.

Ex. A. mirabilis, *Wood,* pl. 86, fig. 13. Operculum, A. Grayana, *Pfeiffer,* fig. 13, *a*, 13, *b*.

With the exception of a single species from Demerara, this group is confined entirely to the Island of Jamaica.

Species of Adamsiella.

chlorostoma, *Sow.*
Grayana, *Pfeiff.*
ignilabris, *C. B. Adams.*
intermedia, *C. B. Adams.*
mirabilis, *Wood.*
miranda, *C. B. Adams.*
monstrosa, *C. B. Adams.*
moribunda, *C. B. Adams.*
pinguis, *Pfeiff.*
pulchrior, *C. B. Adams.*
variabilis, *C. B. Adams.*
xanthostoma, *Sow.*

Sub-fam. POMATIASINÆ.

Operculum horny, ovate, of a few, more or less rapidly-enlarging whorls.

Genus POMATIAS, Studer.

Operculum ovate, cartilaginous, few-whorled, thick, composed of two plates, concamerated within; nucleus excentric.

Shell sub-imperforate, conico-turreted or turreted, longitudinally striated or ribbed; peristome nearly simple, or double, the internal edge continuous, the external expanded or reflexed, often auriculate.

Ex. P. maculatus, *Draparnaud*, pl. 87, fig. 1. Operculum, P. maculatus, fig. 1, *a*, 1, *b*. Shell, P. maculatus, fig. 1, *c*.

These shells come from Italy, Dalmatia, Croatia, Albania, Corfu, and Sicily.

Species of Pomatias.

auritus, *Ziegl.*
Barthelmianus, *Shuttl.*

cinerascens, *Rossm.*
gracilis, *Küst.*
maculatus, *Drap.*
obscurus, *Drap.*
patulus, *Drap.*
Porroi, *Strobel.*
scalarinus, *Villa.*
striolatus, *Porro.*
tessellatus, *Wiegm.*

Genus HYDROCENA, Parreyss.

Operculum thin, horny, pauci-spiral.

Shell imperforate or umbilicated, turreted or globosely turbinate, simple, or keeled around the perforation; aperture oval; peristome with the margins disjoined, straight or expanded.

Ex. H. rubens, *Quoy and Gaimard,* pl. 87, fig. 2. Operculum, H. rubens, fig. 2, *a*, 2, *b*. Shell, H. rubens, fig. 2, *c*.

The Pacific Islands, Opara, Tahiti, Tonga, and the Fijis, are the principal countries inhabited by the species of this genus.

Species of Hydrocena.

albescens, *Pfeiff.*
brevicula, *Pfeiff.*
Bridgesi, *Pfeiff.*
Cattaroënsis, *Pfeiff.*
cornea, *Pfeiff.*
exserta, *Pfeiff.*
gutta, *Shuttl.*
minutissima, *Sow.*
multilineata, *Pfeiff.*
oblonga, *Pfeiff.*
obtusa, *Pfeiff.*
pyramis, *Pfeiff.*
solidula, *Pfeiff.*

Sub-gen. REALIA, Gray (Liarea, *Gray*).

Shell turreted, thin, rather smooth; aperture ovate; peristome continuous, double.

Egea, *Gray.*
rubella, *Pfeiff.*
turriculata, *Pfeiff.*
ventricosa, *Hombr. and Jacq.*

Sub-gen. OMPHALOTROPIS, Pfeiffer.

Shell perforated or umbilicated, with a keel round the umbilicus; peristome straight or expanded.

aurantiaca, *Desh.*
dubia, *Pfeiff.*
erosa, *Quoy.*
expansilabris, *Pfeiff.*
exquisita, *Pfeiff.*
globosa, *Bens.*
hieroglyphica, *Férus.*
Huaheinensis, *Pfeiff.*
glabrata, *Pfeiff.*
granum, *Pfeiff.*
malleata, *Pfeiff.*
multilirata, *Pfeiff.*
plicosa, *Pfeiff.*
pupoides, *Anton.*
pyramis, *Pfeiff.*
radiata, *Pfeiff.*
rosea, *Gould.*
rubens, *Quoy.*
scitula, *Gould.*
solidula, *Pfeiff.*
terebralis, *Gould.*
vallata, *Gould.*

Genus BOURCIERA, Pfeiffer.

Operculum oval, rather solid, horny, whorls few, rapidly enlarging.

Shell heliciniform; columella dentated at the base; aperture oval; peristome expanded.

Ex. B. helicinæformis, *Pfeiffer*, pl. 87, fig. 3. Operculum, B. helicinæformis, fig. 3, *a*, 3, *b*.

There is but one species known, discovered by M. Bourcier at Yaraqui, in the Republic of the Equator.

Fam. HELICINIDÆ.

Lingual teeth with a single, central, flanked on each side by three laterals. Head proboscidiform; tentacles subulate, with the eyes at their outer bases. Foot elongated.

Operculum non-spiral, annular, semi-oval or sub-triangular, with concentric elements, thick and testaceous, or thin and horny.

Shell with the aperture semilunar.

In the character of their lingual dentition, as well as in their organisation generally, these animals do not appear to differ essentially from those of the *Cyclophoridæ;* the tentacles, however, are more slender and produced, and the caudal extremity of the foot is more elongate; the operculum, moreover, is formed on an entirely different plan, and the aperture of the shell, instead of being circular, is semilunar in its outline. In their habits they are very similar to the animals of the *Cyclophoridæ*, but are considerably more locomotive and lively; in common with some other mollusks, as the *Neritidæ* and *Ellobiidæ*, they possess the faculty of removing the internal septa and columella of the shell, though by means of what agency is still uncertain.

Genus HELICINA, Lamarck.

Operculum non-spiral, somewhat semi-oval, membranous or testaceous.

Shell heliciform, turbinate, globose or depressed, base callous around the columella; columella somewhat flattened, rather straight; aperture triangularly semi-oval, entire; peristome simple, straight or thickened, often widely expanded.

Syn. Ampullina, *Blainv.*, not *Lam.*

Ex. H. citrina, *Grateloup*, pl. 87, fig. 4. Operculum, H. citrina, fig. 4, *a*, 4, *b*. Shell, H. neritella, *Lamarck*, fig. 4, *c*.

In *Helicina* proper the peristome is expanded, and not

dentate internally, the whorls are ecarinate, and the spire is small. The species are from the West Indies, Tropical America, the Philippines, and the Pacific Islands.

Species of Helicina.

adspersa, *Pfeiff.*
arenicola, *Morel.*
aurantia, *Gray.*
bulla, *Pfeiff.*
Cumingiana, *Pfeiff.*
flammea, *Quoy.*
fragilis, *Morel.*
fulgora, *Gould.*
globosa, *Gray.*
globulosa, *D'Orb.*
intusplicata, *Pfeiff.*
Jamaicensis, *Sow.*
musiva, *Gould.*
neritella, *Lam.*
oleosa, *Pfeiff.*
parva, *Sow.*
pellucida, *Sow.*
rostrata, *Morel.*
sordida, *King.*
striata, *Lam.*
Tamsiana, *Pfeiff.*
tenuilabris, *Pfeiff.*
Tunki, *Pfeiff.*
uberta, *Gould.*

Sub-gen. OLIGYRA, Say.

Shell sub-globose or conic; spire equalling or excelling the last whorl, whorls ecarinate; peristome expanded.

acuminata, *Velasq.*
ampliata, *C. B. Adams.*
Antoni, *Pfeiff.*
campanula, *Pfeiff.*
chrysocheila, *Shuttl.*
flavida, *Mke.*
Hanleyana, *Pfeiff.*
hæmastoma, *Moric.*
Lanieriana, *D'Orb.*
orbiculata, *Say.*
Oweniana, *Pfeiff.*
pygmæa, *Pot. and Mich.*
Reeviana, *Pfeiff.*
sinuosa, *Pfeiff.*
tenuis, *Pfeiff.*
trochulina, *D'Orb.*
tropica, *Jan.*
turbinata, *Wiegm.*
vernalis, *Morel.*
zephyrina, *Ducl.*

Sub-gen. PACHYSTOMA, Swainson, not Guilding.

Shell depressed, ecarinate, peristome expanded.

acuta, *Pfeiff.*
acutissima, *Sow.*
agglutinans, *Sow.*
amœna, *Pfeiff.*
angulata, *Sow.*
Antillarum, *Sow.*
Besckei, *Pfeiff.*
biangulata, *Pfeiff.*
bicolor, *Pfeiff.*
Braziliensis, *Gray.*
Candeana, *D'Orb.*
caracolla, *Moric.*
carinata, *D'Orb.*
citrina, *Gratel.*
Columbiana, *Phil.*
concentrica, *Pfeiff.*
convexa, *Pfeiff.*
diaphana, *Pfeiff.*
Dysoni, *Pfeiff.*
elongata, *D'Orb.*
fasciata, *Lam.*
fulva, *D'Orb.*
goniostoma, *Sow.*
gonochila, *Pfeiff.*
Gouldiana, *Forbes.*
Guadeloupensis, *Sow.*
Kieneri, *Pfeiff.*
Küsteriana, *Pfeiff.*
Lazarus, *Sow.*
Lindeni, *Pfeiff.*
Louisiadensis, *Forbes.*
lutea, *Less.*
maculata, *Sow.*
minuta, *Sow.*
Moreletiana, *Pfeiff.*
multicolor, *Gould.*
Nicobarica, *Phil.*
nobilis, *C. B. Adams.*
occidentalis, *Gould.*
oresigena, *D'Orb.*
oxytropis, *Gray.*
pallida, *Guild.*
pyramidalis, *Sow.*
rhodostoma, *Gray.*
rotella, *Sow.*
Salleana, *Pfeiff.*
similis, *Sow.*
Sowerbyana, *Pfeiff.*
Stanleyi, *Forbes.*
straminea, *Morel.*
striatula, *Pot. and Mich.*
sublævigata, *Pfeiff.*
substriata, *Gray.*
sylvatica, *D'Orb.*
tæniata, *Quoy.*
Tillei, *Pfeiff.*
trochiformis, *Sow.*
trochlea, *Gould.*
unifasciata, *Gray.*
variabilis, *Wagn.*
versicolor, *Pfeiff.*
viridis, *Lam.*

Sub-gen. PŒNIA, H. and A. Adams.

Peristome internally sub-dentate.

Adamsiana, *Pfeiff.*
depressa, *Gray.*
lineata, *C. B. Adams.*
lirata, *Pfeiff.*
plicatula, *Pfeiff.*
rugosa, *Pfeiff.*
unidentata, *Pfeiff.*
vinosa, *Shuttl.*

Sub-gen. IDESA, H. and A. Adams.

Peristome not dentate within, straight, acute.

beryllina, *Gould.*
cingulata, *Pfeiff.*
cornea, *Sow.*
costata, *Gray.*
Dominicensis, *Pfeiff.*
exigua, *Pfeiff.*
foveata, *Pfeiff.*
inconspicua, *Pfeiff.*
laciniosa, *Migh.*
margaritacea, *Lea.*
microdina, *Morel.*
multicolor, *Gould.*
nitida, *Pfeiff.*
platychila, *Mühlf.*
rotelloidea, *Migh.*
rotunda, *D'Orb.*
rustica, *Pfeiff.*
subfusca, *Mke.*
umbonata, *Shuttl.*
vestita, *Gould.*
villosa, *Anton.*
zonata, *Less.*

Sub-gen. EMODA, H. and A. Adams.

Peristome internally not dentate, straight, thickened, obtuse.

constricta, *Pfeiff.*
crassilabris, *Phil.*
festiva, *Sow.*
lens, *Lea.*
lenticularis, *Sow.*
Maugeriæ, *Gray.*
miniata, *Less.*
occulta, *Say.*
Orbignyi, *Pfeiff.*
pisum, *Phil.*
pulcherrima, *Lea.*
Rohri, *Pfeiff.*
Sagraiana, *D'Orb.*
sanguinea, *Pfeiff.*
silacea, *Morel.*
solidula, *Gray.*
striatula, *Sow.*
submarginata, *Gray.*

Genus TROCHATELLA, Swainson.

Operculum non-spiral, semi-oval, flat, pale, more or less solid, horny.

Shell trochiform or globosely-conical; aperture sub-triangularly semi-oval; columella somewhat flattened, not emitting a callus at the base; margins of the peristome joined by a very thin, not diffuse callus.

Ex. T. pulchella, *Gray*, pl. 87, fig. 5. Operculum, T. pulchella, fig. 5, *a*, 5, *b*.

The West-Indian Islands and Tropical America are the countries that harbour these beautifully-constructed shells, which are at once known by their sub-trochoid form, their expanded peristome, and by the base not being callous beneath.

Species of Trochatella.

chrysostoma, *Shuttl.*
conica, *Pfeiff.*
costellata, *Morel.*
elegantula, *Pfeiff.*
Gaudiana, *Pfeiff.*
Grayana, *Pfeiff.*
Josephinæ, *C. B. Adams.*
Moquiniana, *Recluz.*
opima, *Shuttl.*
Petitiana, *D'Orb.*
pulchella, *Gray.*
rupestris, *Pfeiff.*
semilirata, *Pfeiff.*
Sloanei, *D'Orb.*
stellata, *Velasq.*
Tankervillii, *Gray.*
tenuis, *C. B. Adams.*
virginea, *Lea.*

Sub-gen. VIANA, H. and A. Adams.

Shell ecarinate, with the right margin of the peristome sinuated.

regina, *Morel.*
sagra, *D'Orb.*

Genus SCHASICHEILA, Shuttleworth.

Operculum thin, testaceous, with an intramarginal rib, the inner margin straight, with a thickened lamella inferiorly produced into a point.

Shell globose-conical, covered with a fimbriated epidermis disposed in spiral lines, last whorl rather flattened at the base, the umbilical region callous and deeply impressed; aperture semi-circular; peristome continuous, deeply incised above at the insertion, the superior margin beyond the incision produced into a wing-like process.

Syn. Helicina, part, *Menke.*

Ex. S. alata, *Menke,* pl. 87, fig. 6. Operculum, S. alata, fig. 6, *a*, 6, *b*.

The notch or incision of the outer lip where it joins the body-whorl is the principal character of this genus. The species are few in number.

Species of Schasicheila.

alata, *Mke.*
Nicoleti, *Shuttl.*
pannucea, *Morel.*

Genus ALCADIA, Gray.

Operculum non-spiral, rather solid, semi-oval, the base furnished with a dentiform process.

Shell heliciform, turbinately sub-globose or somewhat depressed, generally pilose, callous at the base around the straight, somewhat flattened columella; aperture triangularly semi-oval; peristome more or less expanded, with a

distinct fissure, generally curved, separating it from the columella.

Ex. A. Brownii, *Gray*, pl. 87, fig. 7. Operculum, A. Brownii, fig. 7, *a*, 7, *b*. Shell, A. Brownii, fig. 7, *c*.

Cuba, Jamaica, Haiti, and other West-Indian Islands are the localities of this group, the shells of which are usually covered with a velvety epidermis, and have a straight, flattened columella; the tooth-like process of the operculum is adapted to the slit in the peritreme.

Species of Alcadia.

Brownii, *Gray*.
citrinolabris, *C. B. Adams*.
consanguinea, *C. B. Adams*.
dubiosa, *C. B. Adams*.
Gossei, *Pfeiff*.
hirsuta, *C. B. Adams*.
hispida, *Pfeiff*.
Hollandi, *C. B. Adams*.
macilenta, *C. B. Adams*.
major, *Gray*.
megastoma, *C. B. Adams*.
microstoma, *C. B. Adams*.
minima, *D'Orb*.
palliata, *C. B. Adams*.
pusilla, *C. B. Adams*.
rubella, *Pfeiff*.
solitaria, *C. B. Adams*.
succinea, *Pfeiff*.

Genus LUCIDELLA, Swainson.

Operculum membranaceous, semi-oval; columellar margin slightly thickened.

Shell depressly heliciform, striated, whorls rounded, a little callous at the base; aperture sinuato-triangular; peristome thick, furnished with strong teeth.

Ex. L. aureola, *Férussac*, pl. 87, fig. 8. Operculum, L. aureola, fig. 8, *a*, 8, *b*. Shell, L. aureola, fig. 8, *c*.

The occurrence of three or four teeth on the thickened peristome renders the *Lucidellæ* peculiar among operculated land shells; one species only is known, from the West Indies.

Genus STOASTOMA, C. B. Adams.

Operculum non-spiral, calcareous, finely and irregularly lamelliferous, externally deeply concave.

Shell globose-conic, depressed or discoidal; aperture semi-oval, or somewhat semi-circular, angulated above and at the base; peristome continuous, right margin rotundate, produced, regularly curved, the left rather straight, retromitting a spiral callus at the base.

Ex. S. pisum, *C. B. Adams*, pl. 87, fig. 9. Operculum, S. pisum, fig. 9, *a*, 9, *b*, 9, *c*.

All the species of *Stoastoma* proper are sculptured with spiral lines, and inhabit the Island of Jamaica. The subgenus *Electrina* is smooth, and is from the Island of Opara.

Species of Stoastoma.

Agassizianum, *C. B. Adams.*
Anthonianum, *C. B. Adams.*
Blandianum, *C. B. Adams.*
Chittyanum, *C. B. Adams.*
Cumingianum, *C. B. Adams.*
Fadyenianum, *C. B. Adams.*
Gouldianum, *C. B. Adams.*
Hollandianum, *C. B. Adams.*
Jayanum, *C. B. Adams.*
Leanum, *C. B. Adams.*
Lindleyanum, *C. B. Adams.*
Moricandianum, *C. B. Adams.*
Petitianum, *C. B. Adams.*
Pfeifferianum, *C. B. Adams.*
Philippianum, *C. B. Adams.*
pisum, *C. B. Adams.*
Redfieldianum, *C. B. Adams.*
Tappanianum, *C. B. Adams.*
Vilkinsoniæ, *C. B. Adams.*

Sub-gen. ELECTRINA, Gray.

Shell smooth.

succineum, *Sow.*

Genus PROSERPINA, Gray.

Shell orbicular, depressed or sub-globose, polished, more or less heliciniform, the base covered with a shining callosity; aperture lamellate internally; peristome simple, acute.

Syn. Odontostoma, *D'Orbig.*, not *Endl.*

Ex. P. nitida, *Gray*, pl. 87, fig. 10.

This genus is composed of a group of pretty little shining shells from Cuba and Jamaica, which are remarkable for their *Helicina*-like appearance, their shining, callous base, and the winding, plait-like teeth in the aperture. According to the observations of Mr. Bland, the animal bears its eyes at the outer bases of the tentacles, but there is no operculum. Until further information has been received, we must be content to regard this genus as belonging to the *Helicinidæ*, but possibly it constitutes a peculiar type of organisation which will cause it to become the nucleus of a new family.

Species of Proserpina.

bidentata, *C. B. Adams.*
depressa, *D'Orb.*
discoidea, *C. B. Adams.*
eolina, *Duclos.*
globulosa, *D'Orb.*
linguifera, *Jonas.*
opalina, *C. B. Adams.*
nitida, *Gray.*

Sub-order OPISOPHTHALMA.

Eyes on the upper part of the head behind the base of the tentacles. Head with a rather produced, aculeated proboscis truncated at the end.

Operculum horny, sub-spiral.

In this division, which comprises, at present, but a single family, the members inhabit the margins of the sea, damp woods, the banks of rivers, and Mangrove swamps. Although a humid atmosphere, and even, in some cases, the spray of the sea seems essential to their welfare, yet they appear to be truly pulmoniferous.

Fam. TRUNCATELLIDÆ.

Animal with a broad, produced, bilobed muzzle; tentacles flattened, sub-triangular; eyes sessile on the middle of their upper bases. Foot very short and rounded.

Operculum horny, sub-spiral.

These animals progress by means of their foot and the fore part of the muzzle, fixing one as a point of support, and drawing the other after it. Gray calls them, in consequence, "Looping Snails."

Genus TRUNCATELLA, Risso.

Operculum sub-membranaceous, obsoletely spiral.

Shell, in the young, subulately turreted, in the adult, cylindrical and truncated; aperture oblong-oval; peristome simple or double, margins rather wide apart, united by a callus.

Syn. Choristoma, *Crist. and Jan.* Fidelis, *Risso* (young).

Ex. T. truncatula, *Montagu*, pl. 88, fig. 1. Operculum, T. truncatula, fig. 1, *a*. Shell, T. truncatula, fig. 1, *b*.

The species of this genus inhabit the East and West Indies, Britain, the Mediterranean, and the Islands of the Corean Archipelago. The animals are amphibious in their habits, being sometimes found under heaps of sea-weed on

the shore, and sometimes in shallow water. In the Corea they live gregariously, by many thousands, in the holes of decayed rock and coral which border, in many places, the Islands; the spots they occupy are always exposed to the spray of the sea.

Species of Truncatella.

Adamsi, *Pfeiff.*
aurantia, *Gould.*
bilabiata, *Pfeiff.*
Caribæensis, *Sow.*
clathrus, *Lowe.*
crassicostata, *Sow.*
Guerinii, *Villa.*
Montagui, *Lowe.*
porrecta, *Gould.*
pulchella, *Pfeiff.*
Quoyi, *Pfeiff.*
rostrata, *Gould.*
scalariformis, *Reeve.*
scalaris, *Mich.*
striata, *Sow.*
striatula, *Mke.*
truncatula, *Drap.*
valida, *Pfeiff.*
vitiana, *Gould.*

Genus GEOMELANIA, Pfeiffer.

Operculum horny, sub-spiral.

Shell imperforate, turreted; aperture entire, effuse, peristome simple, expanded, the margin produced into a somewhat-twisted, linguiform appendage.

Ex. G. Jamaicensis, *Pfeiffer*, pl. 88, fig. 2. Operculum, G. Jamaicensis, 2, *a*, 2, *b*. Shell, G. Jamaicensis, fig. 2, *c*.

The animal of *Geomelania*, first made known by one of the Authors, is very similar to that of *Truncatella;* the operculum and shell also closely resemble those of that genus, the principal difference consisting in the persistent apex of the spire, and the prolongation of the outer lip of the shell into a peculiar tongue-shaped process at the fore part of the aperture. In their habitat they appear to be

still more terrestrial than the *Truncatellæ;* the Island of Jamaica furnishes all the species known, though many, doubtless, exist undiscovered in the adjacent islands.

Species of Geomelania.

affinis, *C. B. Adams.*
Beardsleana, *C. B. Adams.*
conica, *C. B. Adams.*
costulosa, *C. B. Adams.*
elegans, *C. B. Adams.*
exilis, *C. B. Adams.*
expansa, *C. B. Adams.*
fortis, *C. B. Adams.*
gracilis, *C. B. Adams.*
Hilliana, *C. B. Adams.*
Jamaicensis, *Pfeiff.*
magna, *C. B. Adams.*
media, *C. B. Adams.*
minor, *C. B. Adams.*
pauperata, *C. B. Adams.*
procera, *C. B. Adams.*
pygmæa, *C. B. Adams.*
pyramidata, *C. B. Adams*
striosa, *C. B. Adams.*
typica, *C. B. Adams.*
vicina, *C. B. Adams.*

Genus ACICULA, Hartmann.

Operculum very thin, glassy, few-whorled.

Shell sub-imperforate, rather cylindrical; peristome somewhat thickened, the margins sub-parallel, united by a thin callus.

Syn. Acme, *Hartm.* Acmea, *Hartm.* Pupula, *Agass.* Auricella, *Jurine.*

Ex. A. fusca, *Walker*, pl. 88, fig. 3. Shell, A. fusca, fig. 3, *a*.

The species are principally found in Germany, Switzerland, France, Britain, and Northern Italy; they affect localities similar to those preferred by the *Ellobiidæ* and *Truncatellæ*, such as low, marshy situations, especially in the vicinity of the sea.

Species of Acicula.

fusca, *Walker.*
gracilis, *Lowe.*
polita, *Pfeiff.*
producta, *Lowe.*
Simoniana, *Charp.*
spectabilis, *Rossm.*
striata, *Quoy and Gaim.*

Genus TOMICHIA, Benson.

Tentacles tapering, with the eyes on tubercles on their upper bases.

Operculum horny, sub-spiral.

Shell perforate; spire elongated, apex usually truncate, whorls covered with an olivaceous epidermis; aperture oblique, elliptic-oval, vertical; peristome double or triple, continuous, the left margin expanded, rather reflexed, slightly emarginate.

Ex. T. ventricosa, *Sowerby*, pl. 88, fig. 4. Operculum, T. ventricosa, fig. 4, *a*, 4, *b*.

The animal has a short, ovate foot, lobed at the sides in front, and the eyes, according to the observations of Benson, are placed on tubercles on the upper bases of the tentacles; it is a native of India.

Sub-order PROSOPHTHALMA.

Eyes on the middle of the tentacles near their tips. Foot moderate, flat.

Operculum horny, sub-spiral.

The position of the eyes in this division differs materially from that in the two former sub-orders, being placed neither on the hind bases of the tentacles, nor at their outer sides;

they are not, however, on the ends of cylindrical peduncles, as in the *Helicidæ*, but on the upper surface of flat, subulate tentacles, near their tips.

Fam. ASSIMINIIDÆ.

Teeth on lingual membrane, 5—7, cusped, the first and second uncini dentated, the third rounded. Head rostrate, produced and emarginate anteriorly; eyes on the middle of the tentacles near their tips. Foot flat, moderate.

Operculum horny, sub-spiral.

Shell ovately conical, or sub-globose, covered with a horny epidermis.

The shells of these animals resemble those of *Hydrobia* and *Amnicola* among the *Littorinidæ*, but the position of the eyes is very different. In their habits they nearly resemble the Cyclostomatous genus *Hydrocena*, and the genera *Geomelania* and *Truncatella*.

Genus ASSIMINIA, Leach.

Tentacles short, obtuse, with the eyes near the ends.

Operculum of few, rapidly-increasing whorls.

Shell ovato-conical, with the spire more or less produced, whorls flattened, axis not perforate, or slightly rimate; aperture ovate, entire, columellar lip thickened, outer lip acute.

Syn. Syncera, *Gray*. Assiminea, *Auct.*

Ex. A. Grayana, *Leach*, pl. 88, fig. 5. Operculum, A. Grayana, fig. 5, *a*, 5, *b*. Shell, A. Grayana, fig. 5, *c*.

Species of this genus are found in India, China, and Australia; they are amphibious, and generally inhabit

brackish water; one species is very abundant on the muddy shores of the Thames in Kent.

Species of Assiminia.

Francesia, *Bens.* Grayana, *Leach.*

Genus PALUDINELLA, Pfeiffer.

Tentacles broad, sub-triangular, obtuse; eyes on the upper surface of the tentacles near the tips.

Operculum sub-spiral.

Shell turbinate, ovate or depressed, perforate, whorls rounded, covered with an epidermis; aperture sub-circular; peristome simple, somewhat continuous.

Ex. P. littorea, *Delle Chiaje,* pl. 88, fig. 6. Operculum, P. littorea, fig. 6, *a.* Shell, P. littorea, fig. 6, *b.*

These animals are amphibious, living in marshes near the sea; when placed in sea-water, they crawl away and adhere by the foot, which is short and rounded at both ends, to the sides of the vessel; some are inhabitants of fresh-water rivulets.

Species of Paludinella.

abbreviata, *Mich.*
acutissima, *Whit.*
atomaria, *Mühlf.*
atomus, *Phil.*
dubiosa, *C. B. Adams.*
fusca, *Phil.*
gibba, *Drap.*
globulus, *Möll.*
granum, *Mke.*
Lacheineri, *Charp.*
littorea, *Chiaje.*
minuta, *Totten.*
Parreyssii, *Ziegl.*
Petemingensis, *Gould.*
Salinesii, *Pfeiff.*
Schmidtiana, *Charp.*
sincera, *Sars.*
striatella, *Fabr.*

Class CONCHIFERA.

Head indistinct; mouth with elongate fleshy lips or palpi. Body covered with a bilobed mantle, each lobe protected by a shelly valve. Gills lamellar, two on each side. Foot placed under the body, usually compressed and keeled. Valves of shell united on their dorsal edges by a ligament. Animal aquatic. Individual bisexual.

The Bivalve *Mollusca* are without apparent head, and have neither eyes nor tentacles, and the foot, although attached to the belly, does not form a flattened disk as in the Gasteropods, but is laterally compressed, allowing these animals to leap or burrow, but rarely serving them as an organ of reptation. The mantle, which envelopes their body, encloses generally a pair of gills on each side, and is protected by shelly valves; the valves, however, are not usually spiral, as in the *Gasteropoda*, but are simply concave, and joined together at the hind part by a horny ligament.

The *Conchifera* are strictly hermaphrodite and self-impregnating, having both sexes combined in the same individual. They are oviparous, and their fecundity is generally very great, a single *Unio* having been estimated to produce three hundred thousand young in one season. The eggs are hatched in the gill-cavity, or in the outer

branchial leaflets of the parent, or the young are nursed in a special pouch affixed to the gills until they are sufficiently mature to take care of themselves, as in the genus *Sphærium* or *Cyclas*. The *Conchifera* being invariably gill-bearing, all inhabit the water, in which element the young fry undergo a kind of metamorphosis. At first they swim freely about by means of a ciliated disk, at the fore part of which is attached a slender, vibritile filament or *flabellum*. At this period of their lives the young Bivalves are provided with a pair of eyes, situated near the mouth, which afterwards, however, entirely disappear, and the adult animals are totally blind, unless the so-called eyes which are placed around the mantle-margin in some tribes, as the Arcs and Scallops, can be considered as organs of vision. In the next stage of their growth the swimming disk and *flabellum* gradually disappear, the labial palps which surround the mouth become developed, and a new organ of locomotion, or foot, makes its appearance. Some of these young *Conchifera* attain their full growth in the course of a single year, as the *Mytili* and *Cardia*, while others would seem to require an indefinite period for their complete development; such, for example, must be the case with the giant *Tridacna*, which lives in masses of madrepore, and becomes gradually embedded in, and overgrown by, the surrounding coral in the lapse of years. The embryonic shell forms the nuclei or beaks of the valves, and often assumes, as in the *Gasteropoda*, an entirely different appearance from the same shell in its after-stages of growth.

The mouth in the Bivalves is a simple, transversely oval aperture, unprovided with jaws, without a tongue or armed lingual ribbon, but furnished on each side with a pair of soft, membranous palps. These labial palps guard the

orifice of the digestive canal, and may be considered the seat of taste, although these animals appear to be by no means discriminating in the choice of their food, living principally on Infusoria, microscopic vegetables, or particles of decomposed animal matter, which are brought to them by the branchial currents produced by the cilia which clothe the gills. The mouth leads by a short *œsophagus* to the stomach, which, in some tribes, contains an instrument called the crystalline stylet which appears to serve the same purpose as the calcareous plates in the gizzard of the *Bullidæ* among the Gasteropods. The intestine, after a few turns, passes through the ventricle of the heart, and terminates near the hind part of the body either in an anal tube, as in the *Pholadidæ*, or in a free vent, as in the *Pectinidæ*.

The organ of hearing is composed of two simple capsules, filled with a clear fluid, and each containing a round, polished otolith. The sense of touch appears chiefly to reside in the tentacular filaments which spring from the margin of the mantle.

The body of the Bivalve Mollusks is enveloped in a muscular mantle, which is usually more or less united at the margins, forming a branchial cavity with three openings, a pedal, a branchial or inhalent, and an excretory or anal; the pedal orifice being situated anteriorly, and the others towards the hind part. The mantle secretes the shell, the interior of which it lines, and to which it is fixed by the adductor muscles, which pass through it to be attached to the body of the animal. In some families the pallial orifices of the branchial chamber are prolonged into tubes, as in the *Pholadidæ*, in which case the ventral margins of the mantle are usually united, leaving, however, an aperture

for the passage of the foot. In other groups the mantle is entirely open, as in the *Ostreidæ*, in which case there are no distinct pallial orifices, and there is free ingress and egress for the water between the disunited leaves of the mantle. In those families in which siphonal tubes are present, the sinus of the pallial impression is more or less conspicuous, and the gills of each side are united posteriorly and prolonged into the branchial siphon; while in those tribes in which the siphons are wanting, the pallial line is simple, and the branchial plates are distinct on each side, and are not united behind or extended into the branchial tube.

Respiration in the *Conchifera* is always aquatic, and is performed by means of gills, which assume the form of two vascular and membranous lamellæ on each side of the body, covered by the lobes of the mantle, and which vary in structure in different tribes and families. As first shown by Dr. Sharpey, and afterwards confirmed by Mr. Albany Hancock and Dr. T. Williams, the water flows in by the pedal orifice and branchial siphon into the pallial cavity, passes through the gills, and having parted with its oxygen, is conveyed backwards between their laminæ, and is carried out through the upper or exhalent orifice with effete and fecal matter from the intestine. The lower or branchial tube is hence termed the inhalent or respiratory siphon, while the upper or anal has been called the exhalent or excretory siphon. Mr. William Clark denies the existence of any intercommunication, and maintains that the two tubes are independent, and that the water, admitted by the pedal orifice and branchial siphon, is expelled indiscriminately from those apertures.

The foot is the organ of locomotion, and appears to be of great importance in the economy of these animals; it is

very muscular and sensitive, being provided with circular fibres for its protrusion, and with longitudinal muscular bands for its retraction. Some of the *Conchifera*, as the Trigonias, Cockles, and Venuses, move about on the surface of the sand by placing their bent foot under their shells and suddenly straightening it; some, again, bury themselves in the mud and sand by means of their long, conical foot, as the Razor-fish, the Gapers, and the fresh-water Pearl-mussels; some, again, are loosely attached to submarine rocks by a long byssus, as the Mussels and Pinnas, in which case the foot is rudimentary, and furnished with a gland which secretes the tenacious filaments of the byssus; others perforate stones and rocks, as the *Pholades*, in which the foot is strengthened for the purpose with silicious granules; others burrow in wood, as the *Teredines* or Ship-worms, which, on this account, are sometimes very destructive, doing much mischief to timber in dockyards. Many Bivalves, on the other hand, swim freely about by alternately expanding and closing the valves of their shell, as the Pectens, which have hence been termed the "butterflies of the deep;" others are affixed by the surface of the valves to foreign bodies at the bottom of the sea, as the *Ætheria* and *Ostrea*, in which case the foot, in the adult, being no longer required, is obsolete or absent, or it is present only in the young state, when the animal moves freely about. The Arcs crawl, like Gasteropods, upon a locomotive disk, and easily ascend perpendicular surfaces by means of their expanded foot.

The soft bodies of these animals are protected by shelly valves, which are placed one on each side, and which usually assume the form of hollow, flattened cones. They are variously coloured and sculptured on their outer surface,

and are frequently covered with a horny epidermis, which is thick and olive-coloured in fresh-water tribes, as in the genera *Unio* and *Alasmodon;* pilose or covered with a velvet down, as in *Arca* and *Axinæa;* drawn out into long beards or filaments, as in *Modiola;* developed beyond the edge of the shell, as in *Solemya* and *Cyrtodaria;* or prolonged over the bases of the siphons, as in *Glycimeris* and *Mya*. The apices of the valves constitute the beaks, which are usually straight and pointed, as in *Mytilus,* or slightly curved, as in *Cardium* and *Venus,* but sometimes they are contorted or spiral, as in *Chama* and *Bucardia*. The beak or umbo is always directed towards the anterior side of the shell, which is usually the shortest. The right valve is often smaller than the left, and is regarded by Dr. Gray as the homologue of the operculum in Gasteropodous families. The hind part of the shell may be known by the ligament, which is placed behind the beaks, and by the notch or sinus in the pallial line. The fore part of the shell is occasionally the longest, as in *Solemya,* and the valves are often nearly equilateral, as in the *Pectinidæ;* sometimes they gape behind for the passage of the siphons, as in *Myidæ;* but occasionally the gape is ventral, as in *Galeomma,* or anterior, as in *Rocellaria,* in which case the aperture is for the protrusion of the foot. The valves are united at their hinge by a horny, fibrous ligament, which is usually external, and of the same texture as the epidermis; the cartilage is contained in a cavity or "chondrophore" in the hinge-margin, and is elastic and fibrous, keeping the valves habitually open, the closing of the valves being effected at the will of the animal; in some genera it is contained in a spoon-shaped process, as in *Mya, Mactra,* and *Anatina;* in others it is lodged in several pits along

the hinge-margin, as in *Iridina* and *Crenatula;* or it is small and placed in a cavity between the primary teeth, as in *Venus* and *Cardium*. The hinge is placed immediately beneath the beaks, and is usually composed of one or more primary or cardinal teeth, and a lateral or secondary tooth, situated at a little distance on each side. Sometimes the hinge-teeth are numerous and uniform, and arranged along a straight hinge-line, as in *Arca* and *Nucula;* sometimes lateral teeth only are developed, as in *Lasea* and *Alasmodon;* and occasionally they are altogether wanting, as in *Mytilus* and *Serripes*.

The adductor muscles, which serve to close the valves in the *Conchifera*, are two in number in the *Veneridæ*, *Cardiidæ*, and some other families, but in the *Ostreidæ* and *Pectinidæ* there is only one, whence these Mollusks have been arranged by M. Lamarck and others into Monomyaries and Dimyaries, but in some genera, as in *Ætheria* and *Mulleria*, there are two adductor muscles in the young state, and but a single one in the adult; while in *Tridacna* they are central and blended together. The impressions these muscles leave on the interior of the valves is sometimes double, and occasionally there is a third scar produced by the muscle of the foot, as may be seen in the Pectens, while in some few genera, as *Anomia*, there is a fourth caused by the muscle of the plug, and sometimes there is found a small scar under the beak, formed by the retractors of the foot.

The muscular mantle-margin also leaves an impression on the inside of the valves which is called the pallial line, and which is sinuated behind when the animal is possessed of retractile siphons, but which is entire and simple when no siphons are present.

Order PHOLADACEA.

Mantle closed, provided with two contiguous, more or less elongated siphonal tubes, which are usually united; gills two pairs, produced into the lower or branchial siphon; pedal opening small. Foot frequently more or less elongated and club-shaped.

Fam. PHOLADIDÆ.

Animal symmetrical, club-shaped or worm-like. Palpi elongate, linear. Mantle partly exposed, closed in front, except an aperture for the foot; siphons large, elongated, united nearly to their ends, orifices fringed; gills narrow, prolonged into the branchial siphon, attached throughout, closing the branchial chamber. Foot short and truncated.

Shell free, or within a tube; valves equal, gaping at both ends, thin, white, brittle, armed in front with rasp-like imbrications, without hinge-teeth, and strengthened externally by accessory valves; hinge-plate reflexed over the beaks, and furnished with a long, curved, muscular process beneath each; anterior muscular impression on the hinge-plate; pallial sinus very deep.

Living perpendicularly in holes in rock or sand.

The cartilage of the hinge in these shells is small and internal; the ligament is strong and elastic, situated externally, and both are further strengthened by an accessory membrane formed by the coriaceous end of the mantle, which issues between the anterior ends of the valves and covers the ligament; this extension of the mantle is fixed by filaments which enter the dorsal cells, and is furnished

usually with calcareous plates which maintain the valves in position.

The *Pholadidæ* are found in most parts of the globe, living in calcareous rocks, clay, or submerged wood. Fixing their bodies by means of their sucker-like foot, they are enabled to perforate most substances softer than their shells by the mechanical, rotatory action of the valves, assisted by the front portion of the mantle, which is strengthened for the purpose by silicious granules. The grooves of the rasp-like asperities of the shell are visible on the walls of their burrows, and M. Cailliaud has ingeniously demonstrated the power of their mechanical attrition by forming, himself, similar perforations in limestone by carefully rotating the valves of a *Pholas* under water. The burrows are usually vertical and symmetrical, and are enlarged by means of the foot and portions of the siphons and mantle which are often furnished with a rough epithelium for the purpose. On account of their burrowing habits these animals are often very destructive to sea-walls, piers, breakwaters, and other structures under water. In villages along the shores of the Mediterranean the *Pholades* are used as food. They are vividly phosphorescent in the dark.

Sub-fam. PHOLADINÆ.

Animal clavate. Siphons unprovided with shelly styles or palettes. Umbonal muscle protected by one or more shelly, accessory valves.

Living in a cavity not usually lined with a regular shelly tube enclosing the valves.

Genus PHOLAS, Linnæus.

Siphons simple at the base.

Shell elongated, cylindrical, with the anterior gape always open; dorsal valves two, the anterior single, central, and lanceolate, the posterior small and transverse; the hinge-plate reflexed over the beaks closely applied; pallial sinus long and deep.

Ex. P. costata, *Linnæus*, pl. 89, fig. 1, 1, *a*.

In the genus *Pholas*, as restricted, there are two dorsal plates, one anterior and one posterior, whereas in *Dactylina* the accessory pieces are placed side by side.

Species of Pholas.

costata, *Linn.*
crucifera, *Sow.*
latissima, *Sow.*
patula, *Gould.*
truncata, *Say.*

Genus DACTYLINA, Gray.

Siphons naked at the base, the orifice of the branchial cirrhated, the anal simple, or crenate at the margin.

Shell oblong-ovate, valves with the front gape always open; dorsal valves two, lanceolate, placed side by side; the hinge-plate reflexed over the beaks cellular beneath.

Syn. Thovana, *Leach.*

Ex. D. dactylus, *Linnæus*, pl. 89, fig. 2. Shell, D. dactylus, fig. 2, *a*, 2, *b*.

In this genus there is a small transverse plate behind the two dorsal accessory valves, and the space behind, between

the valves of the shell, is filled up by a long, unsymmetrical plate held in its place by a membrane.

Species of Dactylina.

Campechensis, *Gmel.*
dactylus, *Linn.*
orientalis, *Gmel.*

Genus BARNEA, Risso.

Siphons naked at the base, the orifices, both branchial and anal, cirrhated.

Shell oblong-ovate, valves with the anterior gape always open; dorsal valve single, lanceolate; the hinge-plate reflexed over the beaks closely applied.

Syn. Barnia, *Leach.*

Ex. B. parva, *Linnæus*, pl. 89, fig. 3. Shell, B. parva, fig. 3, *a*, 3, *b*.

The single umbonal shield or accessory valve distinguishes this genus from *Dactylina*, and the front gape being open and never closed in the adult by a callous plate from *Martesia*.

Species of Barnea.

Australasiæ, *Gray.*
Bakeri, *Desh.*
Burmanica, *Phil.*
candida, *Linn.*
Erythræa, *Gray.*
fragilis, *Sow.*
Manillensis, *Phil.*
parva, *Linn.*
similis, *Gray.*

Genus XYLOPHAGA, Turton.

Siphons simple at the base, slender, furnished with pectinated ridges, and divided at the end.

Shell globose, gaping widely in front, closed behind; valves divided by a transverse furrow; accessory valves two, half-ovate, small, diverging. Umbonal process none, but the anterior margins of the valves reflexed; pedal processes short and curved.

Ex. X. dorsalis, *Turton*, pl. 89, fig. 4. Shell, X. dorsalis, fig. 4, *a*, 4, *b*, 4, *c*.

The *Xylophaga* is found boring in floating wood, usually forming burrows across the grain about an inch deep, which are oval and lined with shell; the species have been found in Norway, Britain, and South America.

Species of Xylophaga.

dorsalis, *Turt.* globosa, *Sow.*

Genus ZIRPHÆA, Leach.

Shell ovate; umbonal muscle only covered with a horny or coriaceous epidermis; no dorsal valves; hinge-plate not reflexed over the beak; anterior gape always open, not closed in the adult by a callous plate.

Syn. Zirfæa, *Gray*.

Ex. Z. crispata, *Linnæus*, pl. 89, fig. 5, 5, *a*.

In this genus there are no umbonal, shelly valves, the beaks being protected only by a membrane.

Species of Zirphæa.

Beauiana, *Recluz.* crispata, *Linn.*
constricta, *Sow.* julan, *Adams*.

Genus NAVEA, Gray.

Shell ovate, valves with the anterior gape not closed in the adult by a callous plate, a small, transverse, posterior plate under the coriaceous epidermis placed behind the beaks; hinge-plate produced and reflexed over the beaks.

Ex. N. subglobosa, *Gray*, pl. 89, fig. 6, 6, *a*, 6, *b*.

The small shells comprised in this group are usually found embedded in sponge; in general appearance they resemble *Zirphæa*, but the hinge-plate is produced and reflexed over the beaks.

Species of Navea.

nucifera, *O. Fabr.*
subglobosa, *Gray.*
tenuis, *Gray.*

Genus PHOLADIDEA, Turton.

Siphons with horny or shelly valves at their base, the branchial siphon cirrhated, the anal plain at the end.

Shell ovate, with the front gape large, at length closed by a callous plate; dorsal valves two, small.

Ex. P. papyracea, *Solander*, pl. 90, fig. 1. Shell, P. papyracea, fig. 1, *a*, 1, *b*.

Syn. Pholidea, *Swains.* Talonella, *Gray.* Hatasia, *Gray.*

The shelly tube protecting the base of the siphons is absent in young individuals; but in the adult it forms a conspicuous, cup-shaped appendage which appears to be entirely wanting in the other genera which have the anterior

gape closed in the adult, with the exception of *Talona*, in which the front gape is nearly closed.

Species of Pholadidea.

melanura, *Sow.*
papyracea, *Soland.*
quadra, *Sow.*
spathulata, *Sow.*
sulcata, *Brown.*
tridens, *Sow.*
tubifera, *Sow.*

Genus TALONA, Gray.

Siphons with horny or shelly valves at their base.

Shell with the front gape small; dorsal valves two, moderate, diverging.

Ex. T. explanata, *Spengler*, pl. 90, fig. 2, 2, *a*.

In this genus the bases of the siphons are protected by a shelly tube, and the valves are nearly closed anteriorly. There is but one species at present known, the *Pholas explanata* of Spengler or *P. clausa* of Gray.

Genus JOUANNETIA, Desmoulins.

Siphons naked.

Shell globose, inequivalve, the front gape at length closed by a callous plate; right valve produced posteriorly, the left overlapping the opposite valve; dorsal plate single; umbonal process none.

Syn. Pholadopsis, *Conrad.* Triomphalia, *Sow.*

Ex. J. globosa, *Quoy and Gaimard*, pl. 90, fig. 3. Shell, J. globosa, fig. 3, *a*, 3, *b*.

This genus, first established by M. Desmoulins on a fossil species, *J. semicandata*, from Merignac, found

embedded in the interior of madrepores and fragments of calcareous rocks, already comprises four recent species.

Species of Jouannetia.

Cumingii, *Sow.*	globosa, *Quoy and Gaim.*
Darwinii, *Sow.*	pectinata, *Conr.*

Genus PARAPHOLAS, Conrad.

Siphons naked.

Shell ovate-oblong, the front gape at length closed by a callous plate; valves equal, with two oblique sulci extending from the beaks to the base, with longitudinal laminæ between them; dorsal valves two.

Ex. P. quadrizonalis, *Spengler*, pl. 90, fig. 4, 4, *a*.

These shells may be known by the two oblique grooves which divide the surface of the valves, and by the two dorsal plates.

Species of Parapholas.

concamerata, *Desh.*	ovoidea, *Gould.*
Janellii, *Desh.*	quadrizonalis, *Spengl.*

Genus MARTESIA, Leach.

Siphons naked.

Shell ovate-oblong, the front gape at length closed by a callous plate; valves equal, regularly divided in front by a furrow extending from the beaks to the base; dorsal valve single, lanceolate or peltate.

Syn. Penitella, *Conrad.*

Ex. M. striata, *Linnæus*, pl. 90, fig. 5, 5, *a*.

The species of this genus are usually found boring in floating timber and drift-wood. *M. rivicola* was discovered by one of the Authors perforating floating logs used as landing-places at Gunung Taboor in Borneo, twelve miles from the mouth of the river Pantai, where the water was perfectly fresh.

Species of Martesia.

aperta, *Sow.*
australis, *Gray.*
branchiata, *Gould.*
calva, *Sow.*
cuneiformis, *Say.*
curta, *Sow.*
multistriata, *Sow.*
obtecta, *Sow.*
ovum, *Gray.*
rivicola, *Sow.*
striata, *Linn.*

Sub-fam. TEREDININÆ.

Animal worm-like. Siphons furnished at their extremities with two shelly styles or pallettes. Umbonal muscle covered only with a coriaceous epidermis, and not protected by shelly accessory valves.

Living at the inner extremity of a burrow partly or entirely lined with shell.

Genus TEREDO, Linnæus.

Siphonal styles simple, oblong, transverse, entire

Shell globose, gaping anteriorly and behind; valves trilobate, concentrically striated, divided by a single, transverse groove; hinge-margins inflexed anteriorly; interior of valves furnished with a long, curved process for the attachment of the pedal muscle.

Tube sub-cylindrical, hard, shelly, divided longitudinally,

and often concamerated by numerous, incomplete, transverse partitions.

Syn. Cyphus, *Guett.* Kuphus, *Gray.* Kyphus, *Agassiz.* Furcella, *Oken.* Septaria, *Lam.* Clausaria, *Mke.* Cloisonnaria, *Férus.* Malleolus, *Gray.*

Ex. T. Norvegica, *Spengler*, pl. 90, fig. 6. Shell, T. Norvegica, fig. 6, *a*, 6, *b*. Tube, T. Norvegica, fig. 6, *c*. Stylet, T. Norvegica, fig. 6, *d*. T. palmulata, fig. 6, *e*.

The *Teredines* are found in most seas, living in wood, which they perforate by means of the mechanical attrition of their valves; their burrows are usually tortuous and formed in the direction of the grain; the perforations are lined by calcareous matter, and the individuals carefully avoid the burrows of their neighbours. They are useful agents in breaking down and destroying fragments of wrecks and floating timber, which might otherwise be dangerous impediments to navigation; but at the same time they often do incalculable mischief to dikes, submerged piles, and the timbers of ships. The young "Ship-worms" swim freely about, and are even able to float at the surface of the water. M. Laurent has shown that the *Teredines* are ovo-viviparous, the eggs being hatched in the body of the parent, and the young fry being ejected from the upper siphonal tube. The shell and tube in the sub-genus *Xylotrya* are the same as in *Teredo*, but the stylets are pectinate or dentate at the edges; and in *Uperotis*, which has similar valves and stylets, the tube is contorted and club-shaped, from the animal being found burrowing in the husks of cocoa-nuts floating in tropical seas. In the *Teredo gigantea* of Linnæus (the *Septaria arenaria* of Lamarck) the apex of the thick, shelly tube is divided at the end by a longitudinal septum, and is produced into two separate tubes. In the fossil

genus *Teredina* the valves of the shell are cemented, in the adult, to the walls of the tube; in the other genera the shell remains free at the end of the tube. The use of the siphonal, spatulate appendages or stylets, according to Clark, is to assist in compressing and relaxing the siphons to facilitate the flow of water through the long canal.

Species of Teredo.

denticulata, *Gray.*
dilatata, *Stimp.*
elongata, *Quatref.*
fatalis, *Quatref.*
gigantea, *Linn.*
malleolus, *Turt.*
nana, *Turt.*
navalis, *Linn.*
Norvegica, *Spengl.*
pedicellata, *Quatref.*
Petitii, *Recluz.*
Senegalensis, *Desh.*
truncata, *Quatref.*

Sub-gen. XYLOTRYA, Leach (Bankia, *Gray*).

Siphonal pallettes elongate, penniform.

carinata, *Leach.*
palmulata, *Lam.*
pennatifera, *Blainv.*
Philippii, *Gray.*
Stutchburyi, *Leach.*

Sub-gen. UPEROTIS, Guettard (Guettera, *Gray*).

Pallettes ovate, dentate; tube club-shaped or contorted.

clava, *Gmel.*
corniformis, *Lam.*
lagenula, *Lam.*

Fam. GASTROCHÆNIDÆ.

Animal symmetrical, elongated or claviform. Siphons very long, contractile, united almost to their extremities, orifices fringed with cirrhi; mantle-margins united and thickened in front, pedal opening small, anterior; gills two on each side, narrow, prolonged into the branchial siphon. Foot small, cylindrical, anterior, not byssiferous.

Shell equivalve, gaping; valves thin. Hinge-teeth rudimentary; cartilage external, marginal, small, weak. Adductor scars two; pallial line sinuated.

Living enclosed in calcareous tubes, or imbedded in mud or stone, the shell-cases themselves being either free or imbedded.

The *Gastrochænidæ* together with the *Pholades*, constitute the *Tubicola* of Lamarck, a very natural group characterised by their living chiefly enclosed in tubes or burrows, which they never leave. The valves of the shell are sometimes firmly incorporated with the protecting tube, as in *Brechites* or *Aspergillum*, or one valve only is free, as in *Clavagella*, or else both valves are free, as in *Gastrochæna*. The tubes themselves are usually buried, with the thickest end downwards, in the mud or sand near low-water mark.

Genus GASTROCHÆNA, Spengler.

Shell with both valves free, elongated, irregular, inequivalve, widely gaping. Hinge simple, linear, edentulous; ligament external, weak. Hinder muscular impression nearly central, with a pedal scar in front; pallial line with a deep, angular sinus.

Tube testaceous, straight, transversely striated, thickened and closed at the fore part, tapering and open anteriorly, the hinder or lower end, when complete, furnished with a perforated septum behind the valves.

Syn. Chæna, *Retzius*. Fistulana, *Lamarck*.

Ex. G. mumia, *Spengler*, pl. 91, fig. 1. Tube, G. mumia, fig. 1, *a*.

The curious shell on which Spengler founded this genus is generally known under the name of *Fistulana clava*, Lamarck; it is also the type of the *Chæna* of Retzius. They are found, at low-water line, in Singapore, the Philippines, and other islands in the Eastern seas, living gregariously in the mud and sand in large numbers, the tips only of the tubes being visible above the surface, and the closed ends firmly embedded in the soil. Fossil examples have been detected in the inferior Oolite of the United States, Europe, and Southern India.

Species of Gastrochæna.

agglutinans, *Desh.*
grandis, *Desh.*
mumia, *Spengl.*

Genus ROCELLARIA, Fleuriau de Bellevue.

Shell with both valves free, cuneiform, equivalve, widely gaping in front, closed behind; valves very inequilateral; beaks anterior. Hinge simple, linear, toothless, but furnished with a small spatulate lamina; ligament external, long. Muscular impressions small, wide apart, united by a slightly-marked, sinuated pallial impression.

Tube calcareous, claviform, free or fixed, often incomplete.

Syn. Gastrochæna, *Lam.*, not *Spengl.* Trapezium, *Blainv.* Quoyie, *Desh.* Rupellaria, *Agass.* Roxellaria, *Mke.*

Ex. R. dubia, *Pennant*, pl. 91, fig. 2. Shell, R. dubia, 2, *a*, 2, *b*. Tube, R. dubia, 2, *c*.

The *Gastrochæna modiolina* of Lamarck, which we more correctly term *Rocellaria dubia*, often forms flask-shaped tubes, which are only attached by their neck to the fragments of shells in which the animal burrows. It lines the crypts which it excavates in shells and limestones with a shelly layer. There are many species of *Rocellaria*, of world-wide distribution, examples having reached us from the East and West Indies, the British Islands, the Gallapagos, Mauritius, Pacific Islands, and South America.

Species of Rocellaria.

apertissima, *Desh.*
brevis, *Sow.*
cucullata, *Desh.*
denticulata, *Desh.*
difficilis, *Desh.*
dubia, *Penn.*
hians, *Chem.*
humilis, *Desh.*
hyalina, *Sow.*
impressa, *Desh.*
indistincta, *Desh.*
interrupta, *Desh.*
intersecta, *Desh.*
lævigata, *Desh.*
lamellosa, *Desh.*
macroschisma, *Desh.*
mytiloides, *Lam.*
ovata, *Sow.*
Philippinensis, *Desh.*
plicatilis, *Desh.*
pupina, *Desh.*
rostrata, *Spengl.*
rugulosa, *Sow.*
Rüppellii, *Desh.*
spathulata, *Desh.*
tenera, *Desh.*
truncata, *Sow.*

Genus CLAVAGELLA, Lamarck.

Shell oblong, irregular, inequivalve, right valve always free, the left imbedded in the dilated, hind part of the tube. Muscular impressions two, the anterior small, the posterior large; pallial impression with a deep sinus.

Tube testaceous, cylindrical, more or less elongated, posteriorly attenuated and open; the margin of opening simple, or furnished with siphonal fringes; the anterior or lower end of tube ovate, compressed, club-shaped, simple or surrounded by spiniform tubes, and with a minute central fissure, sometimes incomplete.

Syn. Bryopa, *Gray*.

Ex. C. aperta, *Sowerby*, pl. 91, fig. 3. Shell, C. australis, 3, *a*, 3, *b*. Tube, C. australis, fig. 3, *c*.

The mantle in *Clavagella* is furnished with tentacular processes, which form the branching tubuli at the fore part of the tube; the frills or fringes which ornament the hind part of the tube are formed by the siphonal orifices at various stages of growth of the animal; in other respects the animal resembles those of the other genera of the family, the palps being elongate and slender, the mantle closed, the siphons united and extended, and the gills being prolonged into the branchial tube. Most of the recent species of *Clavagella* burrow in stone and coral, and the tube is incomplete and without any spiniform processes; Australia, the Mediterranean, and the Pacific furnish us with examples.

Species of Clavagella.

aperta, *Sow.*
australis, *Sow.*
balanorum, *Schacchi.*
elongata, *Brod.*
lata, *Brod.*
Melitensis, *Brod.*

Genus BRECHITES, Guettard.

Shell small, oval, equivalve, widely gaping, both valves imbedded in the walls of the lower end of the shelly tube, the umbones only being visible externally.

Tube testaceous, elongated, gradually attenuated and open posteriorly, clavate and closed anteriorly or below by a convex disk furnished with numerous tubular holes, and with a minute central fissure, the periphery surrounded by a circular frill of tubes; the posterior or siphonal end plain, or ornamented with ruffles.

Syn. Verpa, *Bolt.* Clepsydra, *Meusch., Schum.* Penicillus, *Brug.* Aquaria, *Perry.* Arytæna, *Oken.* Aspergillum, *Lam.* Adspergillum, *Mke.*

Ex. B. vaginiferus, *Lamarck,* pl. 91, fig. 4. Shell, B. Javanus, *Lamarck,* fig. 4, *a.*

The animal of *Brechites* is very similar to that of *Clavagella,* having the same closed and thickened mantle furnished with filaments in front; the foot is minute, conical, and rudimentary; the palpi are slender and elongated; and the narrow gills, united behind, are prolonged into, and attached to, the walls of the branchial siphon. The species are found imbedded in the sand and mud at low-water on the shores of tropical countries, as Singapore, Australia, New Zealand, Java, and the Red Sea, the closed disk with

the tubuli being below the surface, and the simple or fringed siphonal end projecting about an inch above the surface.

Species of Brechites.

agglutinans, *Lam.*
aquarius, *Burrow.*
australis, *Chenu.*
clavatus, *Chenu.*
Delessertianus, *Chenu.*
dichotomus, *Reeve.*
incrassatus, *Chenu.*
Javanus, *Lam.*
ornatus, *Chenu.*
Philippinensis, *Chenu.*
Recluzianus, *Chenu.*
strangulatus, *Chenu.*
tuberculatus, *Chenu.*
vaginiferus, *Lam.*
Zebuensis, *Chenu.*

Sub-gen. FŒGIA, Gray.

Tube naked, posteriorly clavate; the disk of the club terminal, small, porous, not fimbriated.

Cumingianus, *Chenu.*
incertus, *Chenu.*
Novæ Hollandiæ, *Chenu.*
Novæ Zealandiæ, *Gray.*
semifimbriatus, *Chenu.*
Strangei, *A. Adams.*

Fam. SOLENIDÆ.

Palpi triangular, broad. Mantle-lobes united, except anteriorly, for the passage of the foot; siphons short and united, or longer and partly separate, orifices fimbriated; gills two on each side, narrow, and prolonged into the branchial siphon. Foot large, elongated, thick, club-shaped, truncated in front, not byssiferous.

Shell transversely greatly elongated, sub-cylindrical or oblong, equivalve, gaping at both extremities. Hinge with two or three compressed teeth in each valve, the hinder one

bifid; ligament external, large, linear, marginal, supported on a large prominent pad or fulcrum.

Usually living buried vertically in the sand.

The very natural group of the Solens or "Razor-fish," usually live buried perpendicularly in the sand, penetrating it by means of their large and powerful muscular foot. The outer layer of their shell is formed of long, nucleated, prismatic cells, placed very oblique to the surface, and the inner layer of cell-structure is nearly homogeneous. The long, linear, and narrow gills extend into the branchial siphon, as in the *Pholades*, the elongated tubes of which appear to be represented in this family by the long branchial cavity.

Sub-fam. SOLENINÆ.

Siphons short and united. Foot more or less cylindrical and obtuse.

Shell transversely greatly elongated, gaping and truncate at the extremities; beaks anterior or terminal. Hinge usually with one tooth in each valve. Pallial line with a deep, truncated sinus.

Genus SOLEN, Linnæus.

Siphons very short, united, fringed.

Shell transversely greatly elongated, nearly straight, subcylindrical, margins parallel, ends gaping, beaks terminal. Hinge with one primary tooth in each valve close to the anterior extremity; ligament long, external. Anterior muscular scar elongated; pallial impression with a short, square sinus.

Syn. Fistula, *Mart.* Vagina, *Mühlf.* Solenarius, *Dum.* Hypogæa, Hypogæoderma, *Poli.* Listera, *Leach.*

Ex. S. vagina, *Linnæus*, pl. 92, fig. 1. Shell, S. vagina, fig. 1, *a*, 1, *b*.

In this genus the mantle is produced behind into a truncate siphonal sheath which contains the two short siphons which are never extended beyond the shell. The animal has the power of changing the terminal portion of the foot from a tapering point to an obtuse club. By suddenly extending the foot it is enabled to ascend rapidly the deep burrow it forms in the sand. It has also the power of darting forward, according to the observations of Mr. W. Clark, with a rapidity equal to that of the Pectens. These animals are found buried vertically in the sand between high and low water mark on the shores of most temperate and tropical countries, their short siphons only appearing at the surface. *Solen vagina* is sought eagerly after as a bait for fish, and also, in many parts, as an article of diet.

Species of Solen.

acinaceus, *Hanley.*
albus, *Martyn.*
Beckii, *Phil.*
brevis, *Gray.*
corneus, *Lam.*
cylindraceus, *Hanley.*
exaratus, *Phil.*
gracilis, *Phil.*
Guiniensis, *Gray.*
linearis, *Chem.*
marginatus, *Koch.*
orientalis, *Dkr.*
Philippinarum, *Hanley.*
Tehuelcha, *D'Orb.*
scalprum, *King.*
Schultzeanus, *Dkr.*
sicarius, *Gould.*
Sloanii, *Gray.*
vagina, *Linn.*
versicolor, *Phil.*
viridis, *Say.*
Zeylanensis, *Leach.*

Sub-gen. SOLENA, Browne (Hypogella, *Gray*).

Shell rounded at each end; beaks sub-anterior; anterior adductor impression round.

obliquus, *Spengl.* vaginatus, *Gray.*

Genus ENSIS, Schumacher.

Siphons separate, short.

Shell transversely greatly elongated, gaping and rounded at each end, beaks anterior. Hinge with two teeth in one valve, and three in the other. Anterior adductor scar elongate, horizontal; pallial line with a small, truncate sinus.

Syn. Ensatella, *Swainson.*

Ex. E. ensis, *Linnæus*, pl. 92, fig. 2. Shell, E. ensis, fig. 2, *a*, 2, *b*.

This genus is distinguished from *Solen* by the number of teeth in the hinge, and by the curved form of the valves. The habits of *Ensis* are similar to those of *Solen*.

Species of Ensis.

Americana, *Beck.*
ensis, *Linn.*
Gaudichaudii, *Chenu.*
macha, *Molina.*
magna, *Schum.*
pellucida, *Pennant.*
picta, *Phil.*
siliqua, *Linn.*
vaginoides, *Lam.*

Sub-fam. PHARINÆ.

Siphons elongated and separate for more than half their length. Foot more or less ovate.

Shell transversely elongated, gaping and rounded at the extremities. Hinge usually with two hooked primary teeth in one valve, and three in the other. Pallial line with a deep, rounded sinus.

Genus PHARUS, Leach.

Siphons separate, diverging, fringed at the ends.

Shell thin, compressed, sub-equilateral, invested with an epidermis, beaks sub-central; valves, beneath the hinge, strengthened by a strong, oblique rib. Hinge with three teeth in the right valve, the central one bifurcate; a single, compressed, primary tooth, and a bifid, sub-lateral one in the left valve. Anterior adductor impression elongate, horizontal; pallial line with a short, wide sinus.

Syn. Solecurtoides, *Desmoul.* Polia, *D'Orb.* Ceratisolen, *Forbes.*

Ex. P. legumen, *Linnæus*, pl. 92, fig. 3. Shell, P. legumen, fig. 3, *a*, 3, *b*.

A single species only of this genus is at present known, inhabiting the sandy shores of the Mediterranean, the Red Sea, Senegal, and the British Islands. It is found in a fossil state in the Pliocene of Italy.

Genus PHARELLA, Gray.

Siphons shortly produced and separate. Foot large, abruptly truncate.

Shell sub-cylindrical, transversely greatly elongated, rounded and gaping at both extremities, beaks sub-anterior. Hinge composed of two teeth in one valve, and three in the other. Anterior adductor scar elongate, sub-trigonal; pallial line with a small sinus.

Ex. P. Javanica, *Lamarck*, pl. 93, fig. 1. Shell. P. Javanica, fig. 1, *a*, 1, *b*.

In *Pharella* the siphons are very short and fringed at their orifices, and the mantle-lobes are covered with a wrinkled epidermis; the pedal orifice is terminal, and the foot is straight, compressed, and truncated. The species appear to inhabit the muddy estuaries of rivers, and the shells, like those of *Siliquaria*, are covered with an olivaceous epidermis.

Species of Pharella.

acutidens, *Brod. and Sow.* Javanica, *Lam.*

Genus CULTELLUS, Schumacher.

Siphons separated nearly to their bases. Foot thick and pointed.

Shell compressed, transversely elongated, rounded and gaping at each end, beaks sub-anterior, supported internally by an oblique rib. Hinge formed of two teeth in one valve, and three in the other. Anterior adductor muscular impression rounded, the hinder triangular; pallial line with a small, truncate sinus.

Syn. Macha, *Conrad*, not *Oken*. Leguminum, part, *Chem.*

Ex. C. maximus, *Gmelin*, pl. 93, fig. 2, 2, *a*.

In this genus the foot of the animal is large and abruptly truncate, and the palpi are triangular and broadly attached. The species known are few in number, and have been procured principally from the shores of Africa and India.

Species of Cultellus.

albidus, *Adams and Reeve.*
Californianus, *Conr.*
cultellus, *Linn.*
maximus, *Gmel.*
subteres, *Conr.*

Genus SILIQUA, Mühlfeldt.

Siphons elongate, large, united, covered with a hard epidermis.

Shell transversely oblong, curved, covered with a polished epidermis, compressed, rounded and gaping at the ends, valves strengthened internally by an elevated transverse umbonal rib. Hinge nearer the middle than the anterior end, three compressed primary teeth in each valve. Pallial line with a short, rounded sinus.

Syn. Leguminaria, *Schum.* Aulus, *Oken.* Machæra, *Gould.* Leguminum, part, *Chem.*

Ex. S. radiata, *Linnæus*, pl. 93, fig. 3, 3, *a.*

The species of *Siliqua* exhibit a very extended range in their geographical distribution, examples occurring along the shores of Sitka, Ochotsk, Newfoundland, and Behring's Straits, as well as on the tropical shores of India and the China Seas. Fossil species are found in the Upper Greensand of France and Britain.

Species of Siliqua.

costata, *Say.*
lucida, *Conr.*
media, *Sow.*
minima, *Gmel.*
Nuttallii, *Conr.*
polita, *Wood.*
radiata, *Linn.*
scalprum, *Gould.*
squama, *Blainv.*
violacea, *Desh.*

Genus MACHA, Oken.

Siphons very large, united at the base, free at the ends, branchial orifice fringed, anal plain.

Shell transversely oblong, compressed, rounded and gaping at the extremities, more or less invested with an epidermis, beaks sub-central, margins nearly parallel. Hinge with two diverging primary teeth in each valve; ligament prominent. Anterior muscular impression lobed; pallial impression deeply sinuated.

Syn. Solecurtus, *Blainv.* Solenocurtus, *Sow.* Psammosolen, *Risso.* Cyrtosolen, *Herrm.*

Ex. M. candida, *Renieri*, pl. 93, fig. 4. Shell, M. strigillata, *Linnæus*, fig. 4, *a*, 4, *b*.

The animal of *Macha* is very large, and is not entirely retractile within the shell, the margin of the mantle protruding, especially when the cavity is distended with water. The species usually bury themselves in sand, in the coralline zone, beyond low-water mark, and in consequence are difficult to procure in a living state. Two species are inhabitants of the shores of the British Islands.

Species of Macha.

alba, *Martyn.*
candida, *Renieri.*
exarata, *Phil.*
solida, *Gray.*
strigillata, *Linn.*

Sub-gen. AZOR, Gray.

Shell, with the surface of the valves smooth, and covered with an epidermis.

coarctata, *Gmel.*

Genus SILIQUARIA, Schumacher.

Siphons elongated, cylindrical.

Shell transversely greatly elongated, covered with an epidermis, gaping and rounded at each end, beaks sub-central. Hinge teeth 2, 3. Sinus of pallial impression very deep, extending beyond the umbo.

Syn. Tagelus, *Gray*. Macha, *Gray*, not *Oken*. ? Laconsilla, *Baf.*

Ex. S. gibba, *Spengler*, pl. 93, fig. 5, 5, *a*.

S. gibba, Spengler (or *S. Caribæa*, Lamarck), occurs in countless myriads on the bars of American rivers, in the mud of which it forms cylindrical cavities, exposed at low-water mark. *Novaculina* is found in the mud of river-estuaries in India and China.

Species of Siliquaria.

gibba, *Spengl.*
media, *Sow.*
Quoyi, *Desh.*

Sub-gen. NOVACULINA, Benson.

Beaks sub-posterior; siphonal inflection deep, but not extending as far as the umbo.

acuminata, *Hanley.*
bidentata, *Spengl.*

constricta, *Lam.*
Gangetica, *Bens.*
olivacea, *Metcalfe.*
rufa, *Bosc.*

Fam. SAXICAVIDÆ.

Animal symmetrical, oblong. Mantle-lobes united and thickened in front; siphons large, elongated, often invested with a thick, wrinkled epidermis, united nearly to their ends, the orifices fringed; pedal opening small; gills two on each side, narrow, unequal, united behind, and extending into the branchial siphon. Foot small, digitiform, inferior, furnished with a byssal groove.

Shell equivalve, solid, gaping at each end; hinge-teeth rudimentary; cartilage external, thick, prominent. Pallial impression irregular, sinuated posteriorly.

Perforating stones, or living imbedded in sand and mud, but not enclosed in shelly cases or protecting tubes.

The *Saxicavidæ* approach in many respects the *Gastrochænidæ*, but, though often perforating stones, they do not form shelly cases or protecting tubes. In their closed mantle and extended, united siphons they likewise resemble the *Myidæ*, but their gills extend into the branchial siphon, their body is symmetrical, their foot is furnished with a byssal groove, and their shell is equivalve, with the cartilage external.

Genus SAXICAVA, Fleuriau de Bellevue.

Palpi small, free; siphons large, united nearly to their ends, orifices fringed.

Shell oblong, equivalve, valves rugose, gaping, beaks prominent. Hinge, when young, with two small teeth in each

valve, when adult, edentulous; ligament external, more or less prominent. Muscular impressions strong, wide apart; pallial line interrupted, sinuated posteriorly.

Syn. Chamæpholas, *List.* Glycimeris, *Schum.*, not *Klein* or *Lam.* Didonta, *Schum.* Rhombus, Rhomboides, *Blainv.* Byssomya, *Cuv.* Clotho, *Faujas St. Fond.* Pholeobia, Biapholius, *Leach.* Hiatella, *Daud.* Arcinella, *Phil.*, not *Schum.*

Ex. S. rugosa, *Linnæus*, pl. 94, fig. 1. Shell, S. rugosa, fig. 1, *a*, 1, *b*.

The *Saxicavæ* are few in species, and are usually found burrowing in limestone rocks, the animal being fixed by the byssus to the side of the crypt it excavates. They are also found dwelling in holes of old oyster or other shells, and among masses of *Serpulæ* in the littoral and laminarian zones. Sometimes they do considerable damage to sea-walls. They inhabit the Arctic Seas, the Cape, the Mediterranean, and the Canary Islands, ranging from low-water to 140 fathoms. In the young state, *Saxicava rugosa* gapes at the superior margin, and the hinge is composed of a small tooth in the right valve, and two rather larger oblique teeth in the left valve; in this condition it is the *Hiatella* of Daudin, and the *Arcinella carinata* of Philippi.

Species of Saxicava.

arctica, *Linn.*
australis, *Blainv.*
Cordieri, *Desh.*
Guerinii, *Payr.*
purpurascens, *Sow.*
rugosa, *Linn.*
tenuis, *Sow.*

Genus GLYCIMERIS, Klein.

Siphons large, united as far as their extremities, and invested with a thick, wrinkled epidermis.

Shell transversely oblong, gaping at the sides, valves with the surface wrinkled and grooved transversely, and covered with an epidermis. Hinge composed of a single strong tooth in each valve, which is received into a corresponding pit of the opposite valve; ligament conspicuous, external. Pallial impression continuous, with a deep posterior sinus.

Ex. G. Natalensis, *Woodward*, pl. 93, fig. 2. Shell, G. rugosa, *Bosc.* fig. 2, *a*, 2, *b*.

The *Glycimeris* of Klein has been kept as a genus distinct from *Panopæa* on account of the siphons of the animal being united as far as their ends, while in *Panopæa* they are separate at their extremities; the gills also are short as in *Mya*. The shells, however, of the two forms are very similar, the principal difference being in the character of the pallial impression, which in *Glycimeris* is continuous, but in *Panopæa* broken up into a few scattered spots as in the genus *Saxicava*. *Glycimeris* is founded on the *Mya glycimeris* of Born, which is the same as the *Panopæa Aldrovandi* of Menard, and the *Mya rugosa* of Bosc.

Species of Glycimeris.

abbreviata, *Valenc.*
antarctica, *Gould.*
australis, *Sow.*
generosa, *Gould.*
Japonica, *A. Adams.*
Natalensis, *Woodw.*
rugosa, *Bosc.*
Solandri, *Gray.*
Zelandica, *Quoy and Gaim.*

Genus PANOPÆA, Menard de la Groye.

Siphons large, separated at their ends, covered with a thick, wrinkled epidermis.

Shell equivalve, thick, transversely oblong, gaping at both ends, surface nearly smooth, or transversely furrowed. Hinge formed of a single conical tooth in each valve, lodged in a cavity of the opposite valve; ligament short, external, prominent, attached to strong ridges. Pallial line interrupted, with a deep posterior sinus.

Ex. P. Norvegica, *Spengler*, pl. 94, fig. 3. Shell, P. Norvegica, fig. 3, *a*, 3, *b*.

The animal and shell of this genus very much resemble *Saxicava* on a large scale, and, like that genus, the species are found principally inhabiting the shores of Northern countries, ranging from Ochotsk to the White Sea, Norway, and North Britain.

Species of Panopæa.

Middendorfii, *A. Adams.* Norvegica, *Spengl.*

Genus CYRTODARIA, Daudin.

Palpi large, sickle-shaped, striated inside, the hinder border broad, plain; siphons large, united, covered with a thick epidermis, orifices small, fringed.

Shell equivalve, thick, oblong, transverse, gaping widely at both ends, valves covered with a thick, black, horny epidermis which extends beyond their edges. Hinge callous, edentulous; ligament large, prominent, external. Muscular

impressions wide apart, the hinder elongate; pallial line irregular, strongly marked, the posterior sinus very small.

Syn. Glycimeris, *Lam.*, not *Klein* or *Schum.*

Ex. C. siliqua, *Spengler*, pl. 94, fig. 4. Shell, C. siliqua, fig. 4, *a*, 4, *b*.

Cyrtodaria siliqua is found in the littoral zone of Northern and Arctic seas, living buried in the sand. In general aspect the shell resembles that of some of the Solens, being covered with a thick, horny epidermis, but the siphons of the animal are not entirely retractile, and are enclosed in a tough, coriaceous, wrinkled envelope, as in *Glycimeris* and *Panopæa*. The palpi in *Cyrtodaria* are large and sickle-shaped, the mantle is thickened at the margin, and invested, like the siphons, with a wrinkled epidermis, the pedal opening is very small and quite anterior, and the gills are thick, plaited, and unequal, the outer one being the shortest and rounded in front. In many respects the animal resembles that of *Mya*, but the cartilage of the hinge is external, and the hinge itself edentulous and simple.

Species of Cyrtodaria.

Cumingii, *Dkr.* siliqua, *Spengl.*

Fam. MYIDÆ.

Body not symmetrical. Labial palpi small. Mantle almost entirely closed except for the passage of a small foot; siphons invested with a coarse and wrinkled epidermis, greatly prolonged and united almost to their extremities, the orifices fringed; gills two on each side, elongated, dependent. Foot small.

Shell thick, strong, opaque, porcellanous, gaping posteriorly, valves usually unequal, covered with a wrinkled epidermis. Hinge simple, toothless; cartilage internal; cartilage-pit in a hollow process in one valve.

Living in the sand or mud, lying on the side.

The gills in this family are not prolonged into the branchial siphon, nor is the body of the animal symmetrical. The structure of the shell is cellular, with dark nuclei near the outer surface, and the valves are usually invested with a coarse wrinkled epidermis, which is continued over the mantle and tubes of the animal. The siphons are either wholly or partially retractile. The shells gape usually at both extremities, and the cartilage is contained in a spoon-like cavity at the hinge.

Genus MYA, Linnæus.

Shell oblong or rhomboidal, inequivalve, gaping at the extremities, surface of valves striated or furrowed transversely, and furnished with a wrinkled epidermis, beaks depressed. Hinge composed of a dilated, ascending, spatulate tooth in the left or smaller valve, with a corresponding socket in the right; cartilage short, thick, internal. Pallial impression deeply sinuated.

Syn. Laternula, *Bolten.*

Ex. M. arenaria, *Linnæus,* pl. 95, fig. 1. Shell, M. arenaria, fig. 1, *a*, 1, *b*.

The "Gapers," as they have been termed, bury themselves in the mud and sand in the low-water levels of the littoral zone, and in the soft mud of bays and estuaries, ranging from low-water to twenty-five fathoms. The species are few in number, and principally affect the shores of northern countries, being found in the Arctic Seas, Greenland, Sitka,

Ochotsk, and North America, where they are employed as articles of food. In the *Platyodon* of Conrad the valves are cancellated, and the siphons are stated to bear at the extremity four testaceous, valvular appendages which close the orifices of the tubes.

Species of Mya.

arenaria, *Linn.*
præcisa, *Gould.*
truncata, *Linn.*
Uddevallensis, *Forbes.*

Sub-gen. PLATYODON, Conrad.

Shell ventricose, with undulated concentric striæ, and a slight furrow extending from the beaks to the ventral margin; posterior side short, with radiating striæ. Cardinal tooth erect, dilated, bi-emarginate.

cancellata, *Conrad.*

Genus TUGONIA, Gray.

Shell globular or sub-oval, very inequilateral, widely gaping posteriorly; beaks small, posteriorly reflexed. Hinge with a small, rounded, concave, spoon-shaped process in each valve, projecting obliquely in front, and joined to the valve; an approximated posterior denticle. Ligament external, elongate, horny, marginal, placed transversely across the beaks; cartilage fixed in the spoon-shaped cavity. Muscular impressions unequal, the anterior oval, on the cardinal margin near the hinge; the posterior small, orbicular, near the denticle; pallial impression very short and simply arched.

Syn. Tugon, *Adanson.*

Ex. T. anatina, *Chemnitz,* pl. 95, fig. 2, 2, *a.*

In the genus *Tugonia* the cartilage-processes or spoon-shaped teeth are similar in each valve, and the shell is

abruptly truncated on the posterior side. The recent species known come from the West Coast of Africa; fossil species occur in the Miocene of Dax, and the Morea.

Species of Tugonia.

anatina, *Gmel.*
nobilis, *A. Adams.*
semisulcata, *A. Adams.*

Fam. CORBULIDÆ.

Body not symmetrical. Palpi long, narrow, pectinated on both sides. Mantle closed, except anteriorly; pedal orifice small, the margins dentate; siphons short, united, the orifices fringed with cirrhi, the anal furnished with a tubular, membranous, retractile valve; gills two on each side, dependent, separate, moderately prolonged. Foot long, sub-cylindrical, furnished with a byssal groove.

Shell porcellanous, valves unequal, closed posteriorly. Hinge with a conical tooth and a cartilage-pit in each valve. Pallial line slightly sinuated.

Genus CORBULA, Bruguière.

Siphons very short, united.

Shell ovate, gibbose, closed, very inequivalve; the left valve the smaller, rounded anteriorly, more or less truncate posteriorly; beaks prominent; surface of valves more or less furrowed or transversely striated, covered with an epidermis. Hinge composed of a recurved prominent tooth in the right valve in front of the cartilage-pit, and a projecting cartilage-process in the left valve; cartilage small, interior. Pallial line with a very slight sinus; pedal scars distinct from the adductor impressions.

Syn. Aloides, *Megerle.* Agina, *Turton.* Erodina, *Daudin.* Pacyodon, *Beck.* Lentidium, *Crist. and Jan.* Tomala, Raleta, *Gray.*

Ex. C. gibba, *Olivi*, pl. 95, fig. 3. Shell, C. gibba, fig. 3, *a*, 3, *b*.

Twenty species of *Corbulæ* out of thirty-six are peculiar to the Asiatic region, while twelve are found in the American, two in the Australian, two in the European, and two in that of Africa. The China Seas are very prolific in *Corbulæ*, where they live in mud, or among the *débris* of sand, mud, and shells which constitutes the floor of these seas; they are usually dredged in from ten to thirty fathoms. The outer shell-layer consists of fusiform cells, the inner layer is homogeneous, and is very slightly adherent to the outer layer. The fossil species *C. complanata*, Sowerby, forms the genus *Corbulomya* of Nyst. The sub-genus *Azara* is composed of estuary species, which live buried in the mud of the banks of South-American rivers.

Species of Corbula.

alba, *Phil.*
albuginosa, *Hinds.*
Barrattiana, *C. B. Adams.*
bicarinata, *Sow.*
biradiata, *Sow.*
Blandiana, *C. B. Adams.*
carnosa, *Hinds.*
Catlowæ, *Reeve.*
Chittyana, *C. B. Adams.*
crassa, *Hinds.*
crispa, *Hinds.*
cuneata, *Hinds.*
Dietziana, *C. B. Adams.*
eburnea, *Hinds.*
equivalvis, *Phil.*
erodina, *Lam.*
erythrodon, *Lam.*
faba, *Hinds.*
fasciata, *Hinds.*
fragilis, *Hinds.*
fulva, *C. B. Adams.*
gibba, *Olivi.*
Kjæriana, *C. B. Adams.*
Knoxiana, *C. B. Adams.*
Krebsiana, *C. B. Adams.*
lævis, *Hinds.*
marmorata, *Hinds.*
Mediterranea, *Costa.*

modesta, *Hinds.*
monilis, *Hinds.*
nasuta, *Sow.*
Newtoniana, *C. B. Adams.*
nuciformis, *Sow.*
obesa, *Hinds.*
operculata, *Phil.*
rosea, *Brown.*
rotalis, *Hinds.*
rubra, *C. B. Adams.*
scaphoides, *Hinds.*
semen, *Lam.*
similis, *Hinds.*
solidula, *Hinds.*
speciosa, *Hinds.*
sulcata, *Brug.*
Swiftiana, *C. B. Adams.*
Taheitensis, *Lam.*
tenuis, *Sow.*
trigona, *Hinds.*
truncata, *Hinds.*
tunicata, *Hinds.*
variegata, *Adams and Reeve.*
ventricosa, *Adams and Reeve.*

Sub-gen. AZARA, D'Orbigny (Potamomya, *Hinds*).

Shell nearly smooth, covered with an olivaceous epidermis. Hinge with the cartilage-plate broad and spatulate; two obscure teeth in the right valve. Estuary.

adusta, *Hinds.*
æqualis, *C. B. Adams.*
contracta, *Say.*
inflata, *C. B. Adams.*
labiata, *Maton.*
nimbosa, *Sow.*
ochreata, *Hinds.*
procera, *Hinds.*
trigonalis, *C. B. Adams.*
ustulata, *Reeve.*

Genus SPHENIA, Turton.

Siphons produced, united.

Shell oblong, inequivalve, produced and gaping posteriorly, surface smooth or rugose, covered with an epidermis, beaks incurved. Hinge composed of an erect, dilated, laminar tooth in front of the oblique, triangular cartilage-pit in the right valve, with a corresponding pit in the left; cartilage internal. Pallial impression slightly sinuated.

Ex. S. Binghami, *Turton,* pl. 95, fig. 4. Shell, S. Binghami, fig. 4, *a*, 4, *b*.

The siphons are extended in *Sphenia* much more than in *Corbula*, but the foot is byssiferous, and the anal valve conspicuous; the hinge is also like that of *Corbula*, but the habit of burrowing in oyster-shells and limestone, and the general appearance of the shell, show certain affinities with *Saxicava*. The genus should perhaps be limited to *S. Binghami* and *Rüppellii*; the other species, described as *Spheniæ* by one of the Authors, appear to belong to the genus *Cryptomya* of Conrad, in which the siphons of the animal are short, and the shell thin and somewhat gaping posteriorly.

Species of Sphenia.

Binghami, *Turton.* Rüppellii, *A. Adams.*

Genus CRYPTOMYA, Conrad.

Shell inequilateral, transversely oblong, gaping posteriorly, surface of valves usually radiately striated, or decussated. Hinge formed by a single, elevated, lamellar tooth in the right valve, with a corresponding cavity in the left valve; cartilage internal. Pallial impression with a slight posterior sinus.

Ex. C. Philippinarum, *A. Adams*, pl. 95, fig. 5. Shell, C. Philippinarum, fig. 5, *a*, 5, *b*.

In this genus the siphons are short, and not covered with a coriaceous epidermis, and the shell is thin and decussately striated. The hinge resembles that of *Sphenia*, but in their habits the animals seem to show an analogy to those of *Mya* and *Corbula*, living buried at the surface of sand and mud.

Species of Cryptomya.

Californica, *Conr.*
decurtata, *A. Adams.*
decussata, *Desh.*
elliptica, *A. Adams.*
Mindorensis, *Adams and Reeve.*
Philippinarum, *A. Adams.*
princeps, *A. Adams.*
semistriata, *Hanley.*

Fam. ANATINIDÆ.

Mantle-margins united; siphons elongate, generally more or less separate, the orifices fringed; mantle with a small valvular aperture under the siphons; gills pinnate, apparently one on each side, the outer lamina prolonged dorsally beyond the line of attachment. Foot more or less linguiform.

Shell thin, usually inequivalve, gaping at the hinder extremity, interior nacreous, surface often granular, scabrous, or hispid, beaks often fissured. Hinge-teeth rudimentary; ligament external, thin; cartilage internal, in a pit in each valve, usually furnished with a free ossicle. Muscular impressions faint, the anterior elongated; pallial line usually sinuated.

In the *Anatinidæ* the mantle of the animal is closed, except where the linguiform foot protrudes, the siphons are moderately long, with fringed orifices, and a single branchial lamina, only, appears to be developed on each side. The hinge of the shell is usually without teeth properly so called, but is provided with a spoon-shaped plate or process, and a movable testaceous ossicle connected with each valve by an internal cartilage. The surface of the valves is usually rough or hispid, with large calcareous cells arranged in lines, and is covered with an epidermis; the interior is more or less pearly and nacreous.

Genus ANATINA, Lamarck.

Siphons long, united, covered with a rugose epidermis.

Shell thin, translucent, oblong, ventricose, sub-equivalve, gaping and attenuated at the hinder side; beaks fissured, directed backwards, supported internally by an oblique plate. Hinge composed of a spoon-shaped cartilage-process in each valve, projecting internally, furnished in front with a transverse ossicle. Pallial line with a wide, shallow sinus.

Syn. Auriscalpium, *Megerle.* Butor, *Gistel.* Cyathodonta, *Conrad.*

Ex. A. subrostrata, *Lamarck,* pl. 96, fig. 1. Shell, A. subrostrata, fig. 1, *a*, 1, *b*.

In *Anatina* the pedal opening is small and quite anterior; the palpi are very long, narrow, free, and striated inside; the gills are long and narrow and not continued into the branchial siphon, and the dorsal border is free and nearly as wide as the gill; the siphons are united, thick, and covered with a rugose epidermis; and the foot is very small and compressed. The shells are thin and semitransparent, and the surface of the valves is hispid or rough with calcareous points; the ossicle, or peculiar shelly plate covering the cartilage, is linear. The species are principally from tropical seas, being found in India, the Philippines, New Zealand, and South America. The extinct genera *Cercomya* and *Rhynchomya,* of Agassiz, are founded on fossil shells closely resembling those of *Anatina.*

Species of Anatina.

alta, *C. B. Adams.*
anserifera, *Spengl.*
elegans, *Phil.*
globulosa, *Lam.*

imperfecta. *Lam.*	[illegible] *Lam.*
lanterna. *Born.*	[illegible] *Lam.*
papyracea. *Say.*	[illegible] *Lam.*
prismatica. *Sow.*	[illegible] *Lam.*

Genus PERIPLOMA, [illegible]

Siphons long, slender, separate.

Shell transversely ovate, thin, inequivalve, the left valve more ventricose than the right, surface of valves minutely scabrous: beaks fissured, strengthened within by oblique diverging ribs. Hinge composed of a spoon-shaped, oblique or horizontal process in each valve containing the ossicle and cartilage: ligament external. Anterior muscular impression very narrow and sub-marginal, posterior very small and rounded: pallial line posteriorly sinuated.

Syn. Bontia, *Leach.* Cochlodesma, *Couthouy.* Ligula, *Recluz*, not *Montagu.* Corimya, *Agassiz* (fossil).

Ex. P. ovata, *D'Orbigny*, pl. [illegible] fig. 2. Shell, P. inæquivalvis, *Schumacher*, fig. 2. *a*, 2. *b*.

There does not appear to be any generic difference between *Periploma* and *Cochlodesma*, the latter possessing the usual testaceous appendage, or ossicle, peculiar to most of the genera of this family. The species of *Periploma* are principally inhabitants of the West Indies and the coasts of South America; the *Mya prætenuis* of Pultney is from the shores of Europe, and the *Anatina Leana* of Conrad is from the coasts of the United States. Fossil examples occur in the secondary formations, and constitute the extinct genus *Corimya* of Agassiz.

Species of Periploma.

argentaria, *Conr.*
angulifera, *Phil.*
inæquivalvis, *Schum.*
Leana, *Conrad.*
lenticularis, *Sow.*
ovata, *D'Orb.*
planiuscula, *Sow.*
prætenuis, *Pultn.*

Genus LYONSIA, Turton.

Siphons short, separate at their extremities.

Shell thin, inequivalve, more or less inequilateral, truncate and somewhat gaping posteriorly, both valves convex, the left the larger, surface often striated and invested with an epidermis, interior sub-nacreous. Hinge composed of an oblique cartilage-plate in each valve; cartilage internal, covered in front, with a flat oblong ossicle. Muscular and pallial impressions faint, the latter sinuated.

Syn. Magdala, *Leach.* Hiatella, Myatella, *Brown.* Tetragonostea, Osteoderma, *Desh.* Pandorina, *Scacchi.*

Ex. L. Norvegica, *Chemnitz*, pl. 96, fig. 3. Shell, L. Norvegica, fig. 3, *a*, 3, *b*.

The palpi in *Lyonsia* are triangular and narrow, the orifices of the short, united siphons are fringed, and the linguiform, compressed foot is furnished with a byssal groove. The *Entodesma* of Philippi, from the Island of Chiloë, does not appear from his description to differ materially from *Lyonsia*. The extinct genera, *Ceromya* and *Gresslya* of Agassiz are also very closely allied to this genus, but there is a lamina behind the beaks and within the posterior hinge-margin. In their geographical distribution the species of *Lyonsia* range from the shores of Greenland and Norway to those of India and South

America; examples also occur among the great Islands of the Indian and Philippine Archipelagoes.

Species of Lyonsia.

anatina, *Gray.*
arenosa, *Möll.*
bracteata, *Couth.*
Brasiliensis, *Couth.*
brevifrons, *Sow.*
elongata, *Gray.*
hyalina, *Couth.*
nitida, *Gould.*
Norvegica, *Chem.*
solemyalis, *Lam.*
striata, *Bosc.*

Sub-gen. ENTODESMA, Philippi.

Shell thin, Saxicava-shaped, slightly inequivalve and gaping, covered with a thick epidermis. Hinge edentulous; a semi-circular process in each valve containing the cartilage.

Chilensis, *Phil.*

Genus MYTILIMERIA, Conrad.

Shell sub-oval, inflated, fragile, equivalve, surface of valves covered with a deciduous, thin, yellowish epidermis, beaks sub-spiral. Hinge edentulous, with a slight linear cavity under the beaks; cartilage with a narrow ossicle in front. Muscular impressions two, rather small; pallial line with a broad, obtuse sinus.

Syn. Byssonia, *Valenciennes.*

Ex. M. Nuttallii, *Conrad*, pl. 96, fig. 4, 4, *a.*

These shells differ from the perforating *Modiolæ* in the form and position of the muscular impressions, and in the sinuated pallial line. The typical species is a thin, fragile shell of a white colour, and inhabits the Coast of Califor-

nia, in sponge thrown up attached to the roots of fuci in deep water; the other species, one of which is the *Byssonia cuneata* of Valenciennes, are also found living in *Ascidiæ*. Dr. Gray observes that he has discovered the mark left by the shelly plate or ossicle over the large, sub-internal cartilage in *M. Nuttallii*.

Species of Mytilimeria.

cuneata, *Valenc.*	Nuttallii, *Conr.*
navicula, *Adams and Reeve.*	picta, *Sow.*

Genus THRACIA, Leach.

Siphons divergent, separate nearly their entire length, their orifices fringed.

Shell transversely ovate, thin, inequivalve, compressed, more or less gaping posteriorly, surface of valves nearly smooth, or minutely scabrous, beaks entire. Hinge composed of a slightly-prominent cartilage-process in each valve; cartilage with a free, crescentic ossicle in front; ligament partly internal. Muscular impressions small and dissimilar; pallial line strongly sinuated.

Syn. Odoncinetus, *Costa*. Odontocincta, *Agass*. Odoncyneta, *Cantr*. Cinctodonta, *Herrm*. Osteodesma, *Blainv*., not *Desh*.

Ex. T. declivis, *Pennant*, pl. 96, fig. 5. Shell, T. pubescens, *Pultney*, fig. 5, *a*, 5, *b*.

M. Recluz, in separating the *Rupicola* of Bellevue as a genus distinct from *Thracia*, observes that the foot is simple, and that there is only a single gill, while in *Thracia* he states that the foot is tri-lobed, and the gills two on each

side, being possibly misled by the fact that each lamina, as described by Clark, is divided into two parts by a deep, oblique furrow which gives the appearance of two branchiæ. There appears also to be some mistake about the tri-lobed foot, so that the only difference between the two forms is in the irregular valves and vertical cartilage-processes in ***Rupicola,*** which unite face to face when the valves are closed. About seventeen species of ***Thracia*** have been described from various parts of the world; China and the Eastern Seas, Greenland, the United States, Norway, the British Islands, the Mediterranean, and the Canaries harbouring species.

Species of Thracia.

Conradi, *Couth.*
convexa, *Wood.*
corbuloides, *Desh.*
Couthouyi, *Stimp.*
curta, *Conr.*
declivis, *Penn.*
granulosa, *Adams and Reeve.*
magnifica, *Jonas.*
plicata, *Desh.*
pubescens, *Pultn.*
rugosa, *Conr.*
similis, *Couth.*
squamosa, *Cpr.*
truncata, *Migh.*
villosiuscula, *Macgilliv.*

Sub-gen. RUPICOLA, Fleuriau de Bellevue.

Orifices of siphons simple. Shell irregular; cartilage-process vertical, emarginate above; pallial line with a small, obtuse, triangular sinus.

concentrica, *Fleur. de Bellev.*
distorta, *Turt.*

Genus PHOLADOMYA, Sowerby.

Siphons united. Foot with a small, bifurcate pedal appendage behind.

Shell transversely oblong, thin, white, translucent, equivalve, ventricose, gaping at both sides, anteriorly short and rounded, posteriorly produced and sub-truncate, pearly inside; surface of valves with radiating ribs. Hinge with a small, elongated, triangular pit, and an obscure lamellar tooth in each valve; cartilage short, external, marginal. Pallial impression with a large sinus.

Ex. P. candida, *Sowerby*, pl. 97, fig. 1, 1, *a*, 1, *b*.

As shown by Owen, the animal of *Pholadomya* has the mantle-margins united, with the exception of an aperture for the foot, and a siphonal and an anal orifice, and there is, besides, a fourth small, circular aperture at the under part of the siphons; the gills are single on each side, with the outer lamina prolonged dorsally, and there is an accessory, bifurcate foot. One recent species only is known, *P. candida*, which is found occasionally on the shores of the Island of Tortola, in the West Indies, after hurricanes, being thrown up, it is conjectured, from deep water, by the violence of the wind and waves. Several extinct forms, as *Goniomya*, *Homomya*, *Platymya*, and *Arcomya*, closely allied to *Pholadomya*, have been described by M. Agassiz in his "Etudes critiques."

Genus THETIS, Sowerby.

Siphons surrounded at their base by long cirrhi reflexed on the shell.

Shell ovate or sub-orbicular, ventricose, equivalve, slightly produced and truncate posteriorly, valves covered with a scabrous epidermis, beneath which the surface is minutely punctulated, internally slightly pearly. Hinge with a single, erect cardinal tooth in the right valve, received into a corresponding cardinal fossa in the left; no lateral teeth in the right valve, but an anterior and posterior lateral tooth in the left valve; ligament external; cartilage internal, inserted in a socket in each valve; ossicle distinct. Pallial line sub-marginal, posteriorly very slightly sinuated.

Syn. Poromya, *Forbes.* Embla, *Lovén.* Eucharis, *Recluz.*

Ex. T. granulata, *Nyst and Westendorp*, pl. 97, fig. 2. Shell, T. granulata, fig. 2, *a*, 2, *b*.

The genus *Thetis*, founded by Sowerby on a fossil species, appears to be the same as the *Poromya* of Forbes, the *Embla* of Lovén, and the *Eucharis* of Recluz. The shell figured in the Zoology of the Voyage of H.M.S. Samarang as *Poromya nitida* is a species of *Neæra*. The mantle of the animal in this genus, as observed by M'Andrew, is open in front for the passage of a slender, narrow foot, and the short siphons are surrounded at their base by about eighteen or twenty tentacular filaments which are reflexed over the hind part of the shell. The species known are few in number, and inhabit deep water; they are from Norway, Britain, China, and America. Fossil examples occur in the Neocomian formations of Britain, Belgium, France, and Southern India.

Species of Thetis.

elliptica, *Recluz.*
granulata, *Nyst and West.*
hyalina, *Sow.*
Korenii, *Lovén.*
quadrata, *Hinds.*

Genus TYLERIA, H. and A. Adams.

Shell oblong, equivalve, valves thin, nearly membranaceous, covered with a thin epidermis, rounded anteriorly, gaping and slightly produced posteriorly. Hinge composed of a cartilage-pit in each valve; cartilage internal; ligament partly external; a calcareous lamina extending from the cartilage-pit anteriorly, as far as the front muscular scar, supported in its length by calcareous septa, and free anteriorly. Pallial impression with a slight posterior sinus.

Ex. T. fragilis, *H. and A. Adams*, pl. 97, fig. 3, 3, *a*.

The curious little shell on which this genus is founded was discovered buried in sand, in a burrow in a large *Spondylus* from Mazatlan, by Mr. R. W. Tyler, to whom we have dedicated the genus. The calcareous lamella is connected with the interior of the valves by means of vertical plates, which, being produced on each side, cause the lamella to assume a dentate appearance.

Genus NEÆRA, Gray.

Siphons short, united, the orifices of both with a few long cirrhi, the anal with a membranous valve.

Shell globose or pyriform, more or less beaked and gaping posteriorly, inequivalve, the right valve the smaller, surface smooth, striated, or ribbed longitudinally, never punctate, beaks strengthened internally by a rib on the poste-

rior side. Hinge composed of an oblique and spathulate cartilage-process in each valve, usually with a minute tooth in front, and a more or less developed posterior lateral tooth; ossicle distinct, sub-circular; ligament external, small. Muscular impressions large; pallial line with a very shallow sinus.

Syn. Cuspidaria, *Nardo.* Sphena, *D'Orb.*

Ex. N. cuspidata, *Olivi*, pl. 97, fig. 4. Shell, N. cuspidata, fig. 4, *a*, 4, *b*.

The species of *Neæra* appear to be pretty generally distributed throughout the seas of both temperate and tropical countries. They are inhabitants of deep water, living in from twelve to two hundred fathoms. Examples occur in China, Borneo, the Moluccas, New Guinea, Chili, Madeira, Norway, Britain, and the Mediterranean.

Species of Neæra.

abbreviata, *Forbes.*
alternata, *D'Orb.*
attenuata, *Forbes.*
casta, *Hinds.*
Cleryana, *D'Orb.*
cochlearis, *Hinds.*
concinna, *Hinds.*
costata, *Sow.*
costellata, *Desh.*
cuspidata, *Olivi.*
didyma, *Hinds.*
elegans, *Hinds.*
Gouldiana, *Hinds.*
hyalina, *Hinds.*
Moluccana, *Adams and Reeve.*
nitida, *Adams and Reeve.*
ornatissima, *D'Orb.*
Philippinensis, *Hinds.*
rosea, *Hinds.*
rostrata, *Chem.*
Singaporensis, *Hinds.*
trigona, *Hinds.*

Genus THEORA, H. and A. Adams.

Animal unknown.

Shell compressed, smooth, polished, hyaline, valves

attenuate and gaping posteriorly. Hinge composed of a spoon-shaped cartilage-process projecting into the interior; cartilage internal, without any free ossicle. Muscular impressions elongated; pallial line with a deep, angulated sinus.

Syn. Neæra, sp. *Hinds.*

Ex. T. lata, *Hinds*, pl. 97, fig. 5, 5, *a*.

Mr. Hinds, in his Monograph of *Neæra*, first indicated this group. Alluding to the three species described by him, he observes, that they "are aberrant, and hold the same relations to *Neæra* as *Nucula arctica* (Brod. and Sow.) and its congeners do to that genus." The examples of *Theora* already known were obtained from the Philippines in from four to ten fathoms.

Species of Theora.

fragilis, *A. Adams.*
iridescens, *Hinds.*
lata, *Hinds.*
opalina, *Hinds.*

Genus PANDORA, Solander.

Siphons very short, united nearly as far as their orifices which are divergent and fringed.

Shell inequivalve, thin, closed, beaked behind, pearly within; right valve flat, the other more or less convex. Hinge with a primary tooth in each valve, with corresponding cartilage-pits; no free ossicle; ligament internal. Muscular impressions faint, rounded; pallial line with a very slight sinus.

Syn. Calopodium, *Bolten.* Trutina, *Brown.*

Ex. P. obtusa, *Leach*, pl. 98, fig. 1. Shell, P. inæquivalvis, *Linnæus*, fig. 1, *a*, 1, *b*.

The siphons of *Pandora* are short and united, with the ends diverging and fringed; the mantle is closed, except a small aperture for the narrow, linguiform foot. The outer layer of the shell, as shown by Dr. Carpenter, is composed of regular, vertical, prismatic cells, two hundred and fifty times smaller than those of *Pinna*. The species of *Pandora* are found burrowing in sand and mud, and are met with at depths varying from four to one hundred and ten fathoms. Britain, Spitzbergen, the United States, the Canary Islands, India, New Zealand, and Panama afford examples of this genus.

Species of Pandora.

arenata, *Sow.*
Ceylanica, *Sow.*
cistula, *Gould.*
claviculata, *Cpr.*
cornuta, *C. B. Adams.*
depressa, *Sow.*
discors, *Sow.*
flexuosa, *Donov.*
glacialis, *Leach.*
inæquivalvis, *Linn.*
oblonga, *Sow.*
obtusa, *Leach.*
punctata, *Conr.*
radiata, *Sow.*
striata, *Quoy.*
tabacea, *Gronov.*
trilineata, *Say.*
unguiculus, *Sow.*

Genus MYODORA, Gray.

Shell triangularly ovate; inequivalve, right valve more or less convex, left valve flat; anteriorly rounded, posteriorly slightly flexuous, contracted and truncate; pearly within. Hinge with two elongate teeth diverging from the beak in the right valve, the hinder flat and rather obsolete, and two grooved ridges in the left valve; cartilage internal, in a

triangular pit between the teeth, furnished with a free, sickle-shaped ossicle. Pallial impression sinuated posteriorly.

Ex. M. brevis, *Stutchbury*, pl. 98, fig. 2, 2, *a*.

The structure of the shell in *Myodora* resembles that of *Anatina*, the outer cells being large and somewhat prismatic. The geographical distribution of the species extends from the islands of the China Sea and the Philippines to New Zealand and New South Wales.

Species of Myodora.

brevis, *Stutchb.*
crassa, *Stutchb.*
curvata, *Reeve.*
oblonga, *Reeve.*
ovata, *Reeve.*
Pandoræformis, *Stutchb.*
plana, *Reeve.*
striata, *Desh.*
tincta, *Reeve.*
trigona, *Reeve.*

Genus MYOCHAMA, Stutchbury.

Siphons distinct, unequal, small, their orifices fringed; a minute fourth orifice close to the base of the branchial siphon.

Shell adherent, irregular, inequivalve, the right valve flat, attached, the left valve free, convex, with radiating ribs or grooves. Hinge composed of two diverging tooth-like processes in each valve, with a triangular pit between them for the internal cartilage, which is furnished with a movable ossicle; ligament thin, external. Anterior muscular impression curved, posterior rounded; pallial line with a short, broad sinus.

Ex. M. anomioides, *Stutchbury*, pl. 98, fig. 3. Shell, M. Stutchburyi, *A. Adams*, fig. 3, *a*, 3, *b*. Ossicle, M. Stutchburyi, fig. 3, *c*.

The shells composing this genus are peculiar to the Australasian region, and are found parasitically attached to the outside of other shells or to stones at considerable depths.

Species of Myochama.

anomioides, *Stutchb.*
Keppelliana, *A. Adams.*
Strangei, *A. Adams.*
Stutchburyi, *A. Adams.*
transversa, *A. Adams.*

Genus CHAMOSTREA, Roissy.

Siphons slightly separated, very short, their orifices denticulated. Pedal opening with a small, ventral orifice behind it.

Shell solid, inequivalve, attached by the front slope of the convex dextral valve; beaks anterior, sub-spiral; inside of valves somewhat pearly. Hinge with a small pointed tooth in the left valve, received into a corresponding pit in the right valve; cartilage internal, with a long, curved ossicle; ligament external. Muscular impressions large and rugose, the anterior very long and narrow; pallial line simple.

Syn. Cleidothærus, *Stutchbury.*

Ex. C. albida, *Lamarck*, pl. 98, fig. 4. Shell, C. albida, fig. 4, *a*, 4, *b*. Ossicle, C. albida, 4, *c*.

The animal of *Chamostrea* has been described by Hancock. The pedal opening is small, with a minute, ventral orifice behind it as in *Pholadomya* and *Myochama*. The mantle-lobes are united between the aperture for the foot and the short, diverging, denticulated siphons; the foot is small and compressed; the lips are bi-lobed, and the disunited palpi are long and obtusely pointed. The gills are

single on each side, deeply plaited, united behind, and prolonged in front between the palpi, and each gill is traversed by an oblique furrow. One species only is known, from New South Wales.

Order VENERACEA.

Mantle provided behind with two more or less elongated siphons, a lower or branchial, and an upper or anal; siphons usually separate, situated under the hinder adductor muscle; gills short, not produced into the lower or inhalent siphon. Foot usually compressed, adapted for crawling and leaping.

The families comprised in this division usually have the foot laterally compressed and tongue-shaped for crawling, but in the Cockles it is angularly bent for leaping, and in the Chamas and Clams (*Tridacnidæ*) it is small and rudimentary, as these animals are fixed and stationary. In some of the groups the siphons are long and more or less separated at their extremities, in which case the siphonal inflection is deep, as in the *Veneridæ*, *Mactridæ*, and *Tellinidæ*; in others, the siphons are very short, and the pallial line is consequently simple, as in the *Cardiidæ*, *Chamidæ*, *Tridacnidæ*, and *Cyrenidæ*.

Fam. MACTRIDÆ.

Labial tentacles long and pointed, pectinated on their inner sides. Mantle-lobes more or less free beneath, united before and behind, the margins more or less distinctly fringed; siphons united to their extremities, which are surrounded by fringes of simple cirrhi. Foot lanceolate, sub-anterior.

Shell equivalve. Hinge with two cardinal teeth in each valve, the hinder small, compressed, often rudimentary, the front triangular, more or less deeply notched; lateral teeth of left valve simple, of right valve double; cartilage in an internal triangular pit behind the cardinal teeth. Siphonal inflection distinct.

Sub-fam. MACTRINÆ.

Mantle-lobes free.

Shell sub-triangular, ovate, nearly closed behind; lateral teeth distinct, well-developed, laminar.

Genus TRIGONELLA, Da Costa.

Shell trigonal. Hinge with the cardinal teeth moderate; lateral teeth elongate, linear, sub-equal; ligament marginal, triangular, separated from the cartilage-pit by a shelly ridge. Pallial sinus rounded.

Ex. T. stultorum, *Linnæus*, pl. 99, fig. 1. Shell, T. stultorum, fig. 1, *a*, 1, *b*.

The species of *Trigonella* inhabit all seas, especially those within the tropics. They principally affect the sandy shores, where they live buried a little beneath the surface.

Species of Trigonella.

abbreviata, *King*.
achatina, *Chem*.
Adansoni, *Phil*.
alba, *Lam*.
antiquata, *Spengl*.
Aphrodina, *Desh*.
apicina, *Desh*.
attenuata, *Desh*.
contraria, *Desh*.
corallina, *Linn*.
corbiculoides, *Desh*.
cordiformis, *Desh*.

cornea, *Desh.*
Cumingii, *Desh.*
cuneata, *Chem.*
cygnea, *Chem.*
decora, *Desh.*
discors, *Gray.*
dissimilis, *Desh.*
epidermia, *Desh.*
eximia, *Desh.*
fasciata, *Lam.*
gibbosula, *Desh.*
glabrata, *Linn.*
glauca, *Born.*
grandis, *Lam.*
hepatica, *Desh.*
hians, *Phil.*
inæqualis, *Desh.*
incarnata, *Desh.*
incongrua, *Desh.*
inflata, *Brown.*
intuspicta, *Desh.*
Isabellina, *D'Orb.*
Largilliertii, *Phil.*
lilacea, *Lam.*
lurida, *Phil.*
Luzonica, *Desh.*
maculata, *Chem.*
mera, *Desh.*
meretriciformis, *Desh.*
mitis, *Desh.*
Murchisoni, *Desh.*
obesa, *Desh.*
olorina, *Phil.*
opposita, *Desh.*
ornata, *Gray.*
Petitii, *D'Orb.*
pulchra, *Gray.*
pura, *Desh.*
pusilla, *A. Adams.*
quadrangularis, *Desh.*
radiolata, *Desh.*
Reevei, *Desh.*
Sauliæ, *Gray.*
scalpellum, *Desh.*
semistriata, *Desh.*
semisulcata, *Desh.*
sericea, *Desh.*
stultorum, *Linn.*
subrostrata, *Desh.*
sulcataria, *Desh.*
symmetrica, *Desh.*
tristis, *Desh.*
tumida, *Chem.*
veneriformis, *Desh.*
violacea, *Chem.*
virgo, *Desh.*

Genus MACTRINULA, Gray.

Shell trigonal, thin. Hinge with the cardinal teeth small; lateral teeth short, very close to the cardinal; hinge-margin double; ligament marginal, triangular, separated from the cartilage-pit by a shelly ridge. Pallial sinus rounded.

Syn. Papyrina, part, *Mörch.* Blainvillia, *Hupè.*

Ex. M. plicataria, *Chemnitz*, pl. 99, fig. 2, 2, *a*.

The shells of this genus are thin, more or less plicated,

and generally devoid of colour. The species are from California, the Philippines, and Australia.

Species of Mactrinula.

angulifera, *Desh.*
angusta, *Desh.*
complanata, *Desh.*
dolabrata, *Desh.*
Egena, *Desh.*
explanata, *Desh.*
lævis, *Chem.*
nasuta, *Gould.*
ovalina, *Lam.*
plicataria, *Linn.*
Reevesii, *Gray.*
striatula, *Linn.*
vitrea, *Gray.*

Genus MACTRELLA, Gray.

Shell cordate, triangular, thin. Hinge with the cardinal teeth small; hinder lateral teeth very short, rudimentary, and near the cardinal; ligament marginal, triangular, separated from the cartilage-pit by a shelly ridge. Pallial sinus deep, rounded.

Syn. Papyrina, part, *Mörch.*

Ex. M. alata, *Spengler*, pl. 101, fig. 3, 3, *a*.

Dr. Gray considers *M. striatula*, Linnæus, to be the same as *M. alata*, Spengler, or *M. carinata*, Lamarck, which latter is the type of his genus *Mactrella*. *M. striatula*, however, appears to belong to his genus *Mactrinula*, in which we have therefore included it. The species of *Mactrella* are from South America.

Species of Mactrella.

alata, *Spengl.*
exoleta, *Gray.*

Genus HARVELLA, Gray.

Shell thin, cordate, the hinder slope narrow, keeled. Hinge with the cardinal teeth small; lateral teeth very small, placed close to the cardinal; hinge-margin double; ligament marginal, triangular, separated from the cartilage-pit by a shelly ridge. Pallial sinus rounded.

Ex. H. elegans, *Sowerby*, pl. 99, fig. 4, 4, *a*.

The only representative, at present known, of *Harvella* is from Florida; the shell is white, very thin, and plicated.

Genus SPISULA, Gray.

Shell trigonal, the hinder slope more or less keeled. Hinge with the cardinal teeth moderate; lateral teeth elongate, cross ribbed; ligament triangular, sub-marginal, near the cartilage-pit, not separated from it by any shelly plate. Pallial sinus small, rounded.

Syn. Hemimactra, *Swainson*.

Ex. S. truncata, *Montagu*, pl. 100, fig. 1. Shell, S. solida, *Linnæus*, fig. 1, *a*, 1, *b*.

Species of *Spisula* are found in the British seas, the Mediterranean, on the coasts of North and South America, and in Australia.

Species of Spisula.

aspersa, *Sow.*
corbuloides, *Desh.*
Dysoni, *Desh.*
elliptica, *Brown.*
Mariæ, *A. Adams.*
rostrata, *Spengl.*
rufescens, *Lam.*
Sayi, *Gray.*
solida, *Linn.*
solidissima, *Chem.*
sublanceolata, *Desh.*
subtruncata, *Da Costa.*
tellinoides, *Desh.*
triangula, *Renieri.*
truncata, *Mont.*

Sub-gen. OXYPERAS, Mörch.

Shell triangular, wedge-shaped, solid, transversely plicate.

æquilatera, *Desh.* triangularis, *Lam.*
transversa, *Desh.*

Genus MACTRA, Linnæus.

Shell ovate, trigonal, sub-angular at each end. Hinge with the cardinal teeth moderate; lateral teeth distinct; ligament external, in an oblique, triangular groove opening into the upper edge of the cartilage-pit. Pallial sinus angular.

Syn. Capisterium, *Meuschen.* Scissodesma, Schizodesma, *Gray.*

Ex. M. Spengleri, *Linnæus*, pl. 100, fig. 2, 2, *a.*

The most striking peculiarity in the shells of this genus consists in the oblique triangular fissure which communicates with the cartilage-pit. The two species known are from Africa.

Species of Mactra.

nitida, *Schroëter.* Spengleri, *Linn.*

Genus MULINIA, Gray.

Shell ovate, trigonal, sub-angular at each end. Hinge with the cardinal teeth strong; lateral teeth short, simple; ligament internal, in the same closed pit as the cartilage. Pallial sinus angulated.

Syn. Moulinea, *Phil.*

Ex. M. edulis, *King*, pl. 100, fig. 3. Shell, M. edulis, fig. 3, *a*, 3, *b*.

The species of *Mulinia* are principally found on the coasts of North and South America.

Species of Mulinia.

angulata, *Gray.*
Byronensis, *Gray.*
carinulata, *Desh.*
donaciformis, *Gray.*
edulis, *King.*
exalbida, *Gray.*
Patagonica, *D'Orb.*
Portoricensis, *Shuttl.*
Rodatzi, *Dkr.*
typica, *Gray.*

Genus RANGIA, Desmoulins.

Siphons short, separate.

Shell ovate, triangular, thick, rather produced behind, covered with a brown epidermis; beaks often eroded; margin of valves acute, simple. Hinge with two teeth in each valve, the front one of left valve larger and bifid, the hind one of left and that of right valve equal, small, simple; lateral teeth elongate, the front dilated and angular above; ligament internal, in the upper edge of the deep cartilage-pit; cartilage internal. Pallial sinus short, half-ovate.

Syn. Gnathodon, *Gray.* Clathrodon, *Conrad.*

Ex. R. cyrenoides, *Desmoulins*, pl. 100, fig. 4, 4, *a.*

Rangia cyrenoides of Desmoulins, or *Gnathodon cuneatus* of Gray, is from Lake Pontchartrain in New Orleans, and was formerly an article of diet with the Indians of those parts. The other species are found buried in banks of mud, in brackish water, in the Gulf of Mexico.

Species of Rangia.

cyrenoides, *Desmoul.*
parva, *Petit.*
rostrata, *Petit.*
trigona, *Petit.*

Sub-fam. LUTRARIINÆ.

Mantle-lobes generally united.

Shell oblong or elongate, gaping behind; lateral teeth very small, rudimentary, often obsolete, especially in the adult shell.

Genus TRESUS, Gray.

Shell ovate, oblong, ventricose, hinder gape roundish. Hinge with the cardinal teeth small; lateral teeth very small, close to the cardinal; ligament external, marginal, separated from the cartilage-pit by a shelly plate.

Ex. T. maximus, *Middendorff*, pl. 101, fig. 1, 1, *a*.

The only species of *Tresus* at present known is from California; the shell is thick and rugose, with the posterior gape large and rounded.

Genus DARINA, Gray.

Shell oblong, compressed, rounded and slightly gaping at each end; umbo sub-posterior. Hinge with the cartilage-pit large; lateral teeth very small, close to the cardinal; ligament external, marginal, separated from the cartilage-pit by a shelly plate.

Syn. Erycina, sp. *King*.

Ex. D. solenoides, *King*, pl. 101, fig. 2, 2, *a*.

Darina solenoides was described by King as a species of *Erycina;* the shell is thin and compressed, and is from the Straits of Magellan.

Genus STANDELLA, Gray.

Shell ovate, hinder slope more or less keeled. Hinge with the lateral teeth short, smooth, the anterior oblique; ligament sub-external, marginal, not separated from the cartilage.

Ex. S. striatella, *Lamarck*, pl. 99, fig. 3, 3, *a*.

The species of *Standella* are pretty numerous, and have a wide geographical distribution; they are found in China, Ceylon, Australia, the Philippines, and on the coasts of Africa and Western America.

Species of Standella.

bilineata, *C. B. Adams.*
depressa, *Spengl.*
elongata, *Quoy.*
fragilis, *Chem.*
lateralis, *Say.*
ovalis, *Say.*
ovata, *Gray.*
silicula, *Desh.*
striatella, *Lam.*
velata, *Phil.*

Sub-genus MEROPE, H. and A. Adams.

Shell thin, surface of valves plicate, or radiately ribbed.

Ægyptiaca, *Chem.*
anatinoides, *Reeve.*
Californica, *Desh.*
capillacea, *Desh.*
Nicobarica, *Gmel.*
pellucida, *Chem.*
plicatilis, *Desh.*
Senegalensis, *Phil.*
Solanderi, *Gray.*
thracioides, *Adams and Reeve.*

Genus EASTONIA, Gray.

Shell oblong, rather ventricose, thick, equilateral, radiately ribbed; hinder slope rugose; hinder gape small. Hinge with the cardinal teeth of the left valve compressed, notched; anterior lateral tooth nearly perpendicular; ligament sub-external, marginal, not separated from the cartilage.

Ex. E. rugosa, *Gmelin*, pl. 101, fig. 4, 4, *a*.

The only species of *Eastonia* known is from the coast of Guinea, and is characterised by its ventricose form, and the radiately ribbed surface of the valves.

Genus LUTRARIA, Lamarck.

Shell oblong, elongate, rather compressed, sub-equilateral; umbo sub-anterior; hinder gape moderate, or large. Hinge with the cardinal teeth distinct; anterior lateral teeth erect, hinder very small, often obliterated in adult shells; ligament sub-external, marginal, not separated from the cartilage.

Syn. Cacophona, *Gist.* Cultellus, *Sow.*, not *Schum.* or *Conrad.* Lutaria, *Phil.* Psammophila, *Leach.*

Ex. L. oblonga, *Gmelin*, pl. 101, fig. 5. Shell, L. elliptica, *Lamarck*, fig. 5, *a*, 5, *b*.

The species of *Lutraria* are found on the shores of various countries living buried vertically in the sand or mud, especially of estuaries, at depths ranging from low-water to twenty fathoms. They are from temperate climates; Australia, the Philippines, New Zealand, Britain,

the Mediterranean, and Africa, all harbour examples of the genus.

Species of Lutraria.

arcuata, *Desh.*
australis, *Desh.*
Capensis, *Desh.*
curta, *Desh.*
dissimilis, *Desh.*
elliptica, *Lam.*
elongata, *Gray.*
impar, *Desh.*
maxima, *Jonas.*
oblonga, *Gmel.*
Philippinarum, *Desh.*
planata, *Chem.*
rhynchæna, *Jonas.*
Senegalensis, *Gray.*
Sieboldii, *Desh.*

Genus ZENATIA, Gray.

Shell oblong, elongate, compressed; umbo anterior, submarginal; hinder gape large. Hinge with the cardinal teeth distinct; lateral teeth none; ligament sub-external, marginal, not separated from the cartilage.

Ex. Z. acinacies, *Quoy*, pl. 102, fig. 1, 1, *a*.

The species of *Zenatia* are confined to New Zealand; the shells are much compressed, and may be readily distinguished from *Lutraria* by the position of the hinge which is posterior.

Species of Zenatia.

acinacies, *Quoy.*
Cumingiana, *Desh.*
solenoides, *Desh.*

Genus VANGANELLA, Gray.

Shell transversely oblong, thin, compressed, covered with a hard, polished epidermis; beaks central; valves rounded in front, rather produced and tapering behind, strengthened internally by two diverging, elevated ribs; hinder gape moderate. Hinge with the cardinal tooth of left valve folded together, of right valve small, separate; lateral teeth short, small, close to the cartilage-pit; ligament sub-external, marginal, not separated from the cartilage by any shelly plate; cartilage in a large, elongate, shallow, triangular pit on the upper part of the hinder internal rib.

Syn. Resania, *Gray.*

Ex. V. Taylorii, *Gray*, pl. 102, fig. 2, 2, *a*.

The *Resania lanceolata* of Gray is founded upon the same shell as the *Vanganella Taylorii*. "This genus combines the form and internal appearance of a *Solen* (*Siliqua*) with the hinge-characters of a *Mactra*. The position of the cartilage-pit and the internal ribs at once separate it from *Spisula*." (Gray.)

Genus LABIOSA, Schmidt.

Shell oblong, marked with an oblique posterior ridge, largely gaping and reflexed behind. Hinge with the lateral teeth distinct, the anterior oblique, near the cartilage-pit; ligament sub-external, marginal, not separated from the cartilage.

Syn. Anatina, *Schum.*, not *Lam.* Cypricia, *Gray.* Cryptodon, *Conrad.*

Ex. L. anatina, *Spengler*, pl. 102, fig. 3, 3, *a*.

Conrad, in his description of *Cryptodon*, states that the shell has the general aspect and character of *Lutraria*, but is deeply channelled along the hinge-margin. The animal is furnished with two siphons, bearing at the extremity two corneous valvular appendages which close the orifices of the tubes; it inhabits salt marshes, bare at low water, in the vicinity of Santa Barbara.

Species of Labiosa.

anatina, *Spengl.*
cyprina, *Gray.*
papyracea, *Lam.*

Genus RAËTA, Gray.

Shell cordate, ventricose, thin, slightly produced and rather gaping behind; hinder slope keeled, narrow. Hinge with the cardinal teeth strong; hinder lateral teeth small, distinct; ligament sub-external, marginal, not separated from the cartilage.

Ex. R. canaliculata, *Say*, pl. 102, fig. 4, 4, *a*.

The species of *Raëta* are thin and plicate, and somewhat resemble in appearance the genus *Harvella;* they are from the south coast of America and the China seas.

Species of Raëta.

canaliculata, *Say.*
lyrata, *Hinds.*
papyracea, *Chem.*
pellicula, *Desh.*
pulchella, *Adams and Reeve.*
rostralis, *Desh.*
tenera, *Desh.*
tenuis, *Hinds.*
undulata, *Gould.*

Genus CÆCELLA, Gray.

Shell oblong, sub-equilateral. Hinge with the cardinal tooth of left valve broad, triangular, notched; lateral teeth

very small, close to the cardinal tooth; cartilage-pit produced into the cavity of the shell; ligament marginal, near the cartilage.

Ex. C. turgida, *Deshayes*, pl. 102, fig. 5, 5, *a*.

The shells comprised in this group inhabit the mud of shallow bays; the surface of the valves is covered with an olivaceous or green epidermis, and the sides are closed.

Species of Cœcella.

Chinensis, *Desh.*
convexa, *Desh.*
Cumingiana, *Desh.*
lata, *Desh.*
oblonga, *Desh.*
tenuis, *Desh.*
transversalis, *Desh.*
turgida, *Desh.*
Zebuensis, *Desh.*
Zelandica, *Desh.*

Genus HETEROCARDIA, Deshayes.

Shell transversely ovate, sub-trigonal, transversely striated, gaping posteriorly; beaks minute. Hinge narrow, cardinal lamina narrow, canaliculated. Sinus of pallial impression very deep, extending as far as the anterior muscular scar.

Ex. H. gibbosula, *Deshayes*, pl. 102, fig. 6, 6, *a*.

The genus *Heterocardia* comprises but few species, which are from the Philippine Islands.

Species of Heterocardia.

Cumingii, *Desh.*
fabagella, *Desh.*
gibbosula, *Desh.*

Genus ANATINELLA, Sowerby.

Shell transversely oblong, equivalve, rather gaping posteriorly; valves covered with a thin, smooth epidermis. Hinge composed of a spoon-shaped process in each valve, with two small teeth on each side in the right valve, and a single somewhat bifid tooth in the left; cartilage internal, no testaceous appendage. Anterior muscular impression elongate, slender, marginal, hinder oblong triangular; pallial line simple posteriorly.

Ex. A. candida, *Chemnitz*, pl. 102, fig. 7, 7, *a*.

The *Anatinellæ* have been compared to *Lutrariæ* without any lateral teeth. One species is from China, one from Ceylon, and a third from the islands of the Philippine Archipelago, where it is found on the sands at low-water.

Species of Anatinella.

candida, *Chem.*
dilatata, *A. Adams.*
ventricosa, *A. Adams.*

Fam. TELLINIDÆ.

Palps large and triangular. Mantle widely open anteriorly, and with the margins usually fringed or furnished with short filaments; siphons very long, slender, diverging, separated from each other in their entire length; gills unequal, united behind. Foot compressed, broad, geniculate, and linguiform.

Shell free, regular. Hinge with two cardinal teeth, at most, in each valve; sometimes lateral teeth; ligament ex-

ternal or internal, on the shorter side of the shell. Pallial impression largely and deeply sinuated.

Sub-fam. TELLININÆ.

Animal with the siphons elongated.

Shell compressed, often slightly gaping posteriorly. Hinge with the ligament external, prominent.

Genus ASAPHIS, Modeer.

Shell transversely oblong, ventricose, equivalve, slightly gaping at the sides; surface of valves rugose, radiately ribbed or striated. Hinge with two primary teeth in each valve, one of which is bifid; ligament external, large and conspicuous. Pallial line with a short sinus.

Syn. Capsa, part, *Brug.* Capsula, *Schum.* Sanguinolaria, *Lam.* 1818, not 1801. Isarcha, *Gistel.*

Ex. A. deflorata, *Linnæus*, pl. 103, fig. 1, 1, *a*.

The species of *Asaphis* already described are found buried in the sand below high water-mark in the West Indies, Brazil, China, and Australia. They are also found fossil in the Green-sand of Europe and the United States.

Species of Asaphis.

concinna, *Martyn.*
deflorata, *Linn.*
dichotoma, *Anton.*
Tahitensis, *Birn.*

Genus GARI, Schumacher.

Shell transversely oblong, equivalve, sub-equilateral, slightly gaping at the sides; surface of valves smooth, or

radiately striated; the internal margin finely crenulate, and somewhat thickened anteriorly; hinder side more or less angular. Hinge with two teeth, or a single bifid tooth in one valve, and one in the other; ligament external, prominent. Pallial line deeply sinuated.

Syn. Psammobia, *Lam.* Psammotæa, part, *Lam.*

Ex. G. vespertina, *Lamarck*, pl. 103, fig. 2. Shell, G. Gari, *Linnæus*, fig. 2, *a*, 2, *b*.

The species are found living in sand or gravelly mud, and range from the littoral and coralline zones to the depth of one hundred fathoms. A few examples inhabit the shores of Britain, and others, with shells of great delicacy and beauty, are natives of the Pacific and Indian Oceans, New Zealand, Australia, China, and Japan.

Species of Gari.

abrupta, *Desh.*
amethistina, *Chem.*
amœna, *Desh.*
anomala, *Desh.*
bicarinata, *Desh.*
compta, *Desh.*
corrugata, *Desh.*
denticulata, *Adams and Reeve.*
dispar, *Desh.*
elegans, *Desh.*
Ferroënsis, *Chem.*
Gari, *Linn.*
insignis, *Desh.*
intermedia, *Desh.*
Lessoni, *Blainv.*
lineolata, *Gray.*
marmorea, *Desh.*
ornata, *Desh.*
palmula, *Desh.*
pennata, *Desh.*
præstans, *Desh.*
puella, *Desh.*
pulchella, *Lam.*
pulcherrima, *Desh.*
rubicunda, *Desh.*
rugulosa, *Adams and Reeve.*
squamosa, *Lam.*
tellinæformis, *Desh.*
tenuis, *Desh.*
tripartita, *Desh.*
zonalis, *Lam.*

Sub-gen. PSAMMOCOLA, Blainville (Azor, *Leach*, not *Gray*).

Shell with the surface of the valves smooth; the hinder side but slightly angulated.

castrensis, *Chem.*
florida, *Gould.*
grata, *Desh.*
lata, *Desh.*
maxima, *Desh.*
nivosa, *Desh.*
occidens, *Lam.*
oriens, *Desh.*
solida, *Gray.*
Strangei, *Gray.*
togata, *Desh.*
tristis, *Desh.*
vespertina, *Lam.*

Sub-gen. AMPHICHÆNA, Philippi (Psammobella, *Gray*).

Shell elongated, gaping at both sides, the hinder side rounded.

angusta, *Desh.*
candidula, *Desh.*
costulata, *Turton.*
Kindermanni, *Phil.*
Menkeana, *Desh.*
modesta, *Desh.*
petalina, *Desh.*
tellinella, *Lam.*

Genus SANGUINOLARIA, Lamarck.

Shell equivalve, inequilateral, transversely oblong, thin, compressed, a little gaping at both sides, attenuated but not carinate posteriorly; margins curved, not parallel. Hinge with two approximate primary teeth (sometimes bifid) in each valve; ligament external, conspicuous, on a prominent fulcrum or thickening of the hinge-margin. Pallial line with a deep sinus.

Syn. Lobaria, *Schum.*, not *Müll.*

Ex. S. sanguinolenta, *Chemnitz*, pl. 103, fig. 3, 3, *a*.

The siphons of the animal, like those of most of the genera in this family, are very long and slender, the mantle is freely

open, and fimbriated at the edge, and the foot is broad, laterally compressed, and linguiform. The species are few in number, and are from the Red Sea, Japan, and Australia.

Species of Sanguinolaria.

purpurea, *Desh.*
sanguinolenta, *Chem.*
tellinoides, *A. Adams.*
vitrea, *Desh.*

Genus HIATULA, Modeer.

Shell compressed, transversely oval, gaping at both sides, rounded anteriorly, beaked and carinate posteriorly. Hinge with two small cardinal teeth in each valve; ligament external, conspicuous, thick, supported on prominent callosities of the hinge-margin. Pallial line deeply sinuated.

Syn. Soletellina, *Blainville.*

Ex. H. rostrata, *Spengler,* pl. 103, fig. 4, 4, *a.*

The species of *Hiatula* are chiefly from India, China, Japan, the Philippines, and the south coast of America; the shells are covered with an epidermis, and are generally of a violet or purple colour.

Species of Hiatula.

acuminata, *Desh.*
Adamsi, *Desh.*
atrata, *Desh.*
biradiata, *Wood.*
consobrina, *Desh.*
Cumingiana, *Desh.*
diphos, *Linn.*
epidermia, *Desh.*
incerta, *Desh.*
Japonica, *Desh.*
nitida, *Gray.*
Nuttallii, *Conr.*
nymphalis, *Desh.*
obscurata, *Desh.*
planulata, *Desh.*
rostrata, *Spengl.*
tumens, *Desh.*

Sub-gen. PSAMMOTÆA, Lamarck (Capsella, *Desh.*, not *Gray*).

Shell with the hinder slope somewhat angulated, not beaked; valves smooth, covered with an epidermis.

Chinensis, *Desh.*
crassula, *Desh.*
difficilis, *Desh.*
elongata, *Lam.*
Layardi, *Desh.*
lunulata, *Desh.*
minor, *Desh.*
rosacea, *Desh.*
rufa, *Desh.*
solenella, *Desh.*
tenuis, *Desh.*
violacea, *Lam.*
virescens, *Desh.*

Sub-gen. PSAMMOTELLA, Deshayes.

Shell thin, covered with an epidermis; hinder side rounded, not rostrate.

ambigua, *Desh.*
oblonga, *Desh.*
Malaccensis, *Desh.*
Philippinensis, *Desh.*
rubra, *Chem.*
subradiata, *Desh.*

Genus ELIZIA, Gray.

Shell sub-orbicular, equivalve, compressed, thin; surface of valves covered with a hard, shining epidermis; beaks sub-anterior, not prominent. Hinge with the primary teeth oblique, two in the right valve, the hinder elongate and bifid; three in the left valve, the central bifid. Pallial line sub-marginal; siphonal inflection deep, oblong, proceeding from the upper part of the hinder margin to the centre of the valves.

Ex. E. orbiculata, *Wood*, pl. 103, fig. 5, 5, *a*.

The animal of this genus is unknown; the shell on which it is founded is the *Solen orbiculatus* of Wood.

Genus TELLINA, Linnæus.

Shell ovate, oblong, or rounded posteriorly; beaked or angular, with a flexuosity on the hind slope; surface of valves smooth, or marked with transverse or radiating striæ; inner margin of valves smooth. Hinge with one or two primary teeth in each valve; lateral teeth present, or obsolete; ligament external. Muscular impressions oblong; pallial line with a deep and wide sinus.

Syn. Musculus, *Martini.*

Ex. T. crassa, *Pennant,* pl. 103, fig. 6. Shell, T. radiata, *Linnæus,* fig. 6, *a*, 6, *b.*

The species of *Tellina,* including those of its numerous sub-genera, have a wide geographical distribution, being found in all parts of the world, although they are most abundant and most highly coloured in the seas of tropical regions. They range from low-water to fifty fathoms, usually, however, living buried in the sand on the sea-shore. The animals have the power of leaping from the surface by means of their muscular foot. The valves of the shell are often exquisitely coloured, and very elegant in form.

Species of Tellina.

Brasiliana, *Spengl.*
elegans, *Gray.*
radiata, *Linn.*

Sub-gen. TELINELLA, Gray.

Shell oblong, elongated; posterior side sub-rostrated, or rostrated. Hinge with two lateral teeth in one valve.

abbreviata, *Desh.*
amœna, *Desh.*
angusta, *Gmel.*
Antonii, *Phil.*

asperrima, *Hanley.*
assimilis, *Desh.*
attenuata, *Desh.*
brevirostris, *Desh.*
chloroleuca, *Lam.*
concentrica, *Gould.*
cruciata, *Spengl.*
crucigera, *Lam.*
Cumingii, *Hanley.*
decolorata, *Desh.*
deltoidalis, *Lam.*
denticulata, *Desh.*
Deshayesii, *Hanley.*
dialeuca, *Desh.*
diaphana, *Desh.*
Diemensis, *Desh.*
egregia, *Desh.*
exculta, *Gould.*
flammula, *Desh.*
gelida, *Hanley.*
grata, *Desh.*
gratiosa, *Desh.*
Guildingii, *Hanley.*
hippopoidea, *Phil.*
incerta, *Desh.*
interrupta, *Wood.*
jubar, *Hanley.*
lævigata, *Linn.*
lata, *Quoy and Gaim.*
latirostra, *Lam.*
lineata, *Turton.*
lingua-felis, *Linn.*
Listeri, *Hanley.*
Madagascariensis, *Gmel.*
marginalis, *Dillw.*
ornata, *Desh.*
ostracea, *Lam.*
Owenii, *Hanley.*
perna, *Spengl.*
perplexa, *Hanley.*
Pharaonis, *Hanley.*
plicata, *Valenc.*
pulchella, *Lam.*
pulcherrima, *Sow.*
Quoyi, *Desh.*
rastellum, *Hanley.*
resecta, *Desh.*
rosea, *Spengl.*
rostrata, *Linn.*
rubicunda, *Gould.*
rufa, *Desh.*
rugosa, *Born.*
semiaspera, *Desh.*
serrata, *Da Costa.*
Sieboldi, *Desh.*
spinosa, *Hanley.*
splendida, *Desh.*
squamifera, *Desh.*
squammulosa, *A. Adams.*
staurella, *Lam.*
subtruncata, *Hanley.*
sulcata, *Wood.*
sulcatina, *Desh.*
Tithonia, *Gould.*
Tongana, *Quoy and Gaim.*
undulata, *Hanley.*
venusta, *Desh.*
verrucosa, *Hanley.*
vinosa, *Desh.*
virgata, *Linn.*
vulsella, *Chem.*
Woodii, *Desh.*

Sub-gen. PERONÆODERMA, Mörch.

Shell oval, compressed, posterior side acuminate. Hinge with two lateral teeth in one valve.

albinella, *Lam.*
alternata, *Say.*
Amboynensis, *Desh.*
Broderipii, *Desh.*
eburnea, *Hanley.*
Hanleyi, *Desh.*
inæquistriata, *Donov.*
laceridens, *Hanley.*
plectrum, *Hanley.*
princeps, *Hanley.*
prora, *Hanley.*
punicea, *Born.*
regia, *Hanley.*
rubescens, *Hanley.*
Sowerbyi, *Hanley.*
striata, *Chem.*

Sub-gen. MŒRA, H. and A. Adams (Donacilla, *Gray*, not *Lam.*).

Shell oblong, posterior end short and wedge-shaped. Hinge with two lateral teeth in one valve.

distorta, *Poli.*
donaciformis, *Desh.*
donacilla, *Cpr.*
donacina, *Linn.*
Gouldii, *Hanley.*
pygmæa, *Phil.*
rhomboides, *Quoy and Gaim.*
semen, *Hanley.*
silicula, *Desh.*
tulipa, *Hanley.*
virgulata, *Hanley.*

Sub-gen. ARCOPAGIA, Leach.

Shell ovate or orbicular, posterior side rounded. Hinge with two lateral teeth in one valve.

ampullacea, *Phil.*
balaustina, *Linn.*
capsoides, *Lam.*
carnicolor, *Hanley.*
casta, *Hanley.*
concentrica, *Gould.*
crassa, *Penn.*
cuspidata, *Desh.*
cyrenoidea, *Hanley.*
decussata, *Lam.*
disculus, *Desh.*
discus, *Hanley.*
fabagella, *Desh.*
fausta, *Donov.*
Gargadia, *Linn.*
fimbriata, *Hanley.*

ingens, *Desh.*
lamellata, *Cpr.*
Leda, *Desh.*
lucinoides, *Hanley.*
lyra, *Hanley.*
nucleolus, *Desh.*
nux, *Hanley.*
perula, *Gould.*
pinguis, *Hanley.*
pretiosa, *Desh.*
pristis, *Lam.*
pudica, *Hanley.*
radians, *Desh.*
regularis, *Cpr.*
remies, *Linn.*
robusta, *Hanley.*
scobinata, *Linn.*
sculptata, *Desh.*
Strangei, *Desh.*
tessellata, *Desh.*

Sub-gen. PHYLLODA, Schumacher.

Shell greatly compressed, transversely oblong; posterior side narrow, angular and carinate at the margin. Hinge with the primary teeth divergent, sub lamellar; one approximate lateral tooth in one valve.

foliacea, *Linn.*
sol, *Hanley.*

Sub-gen. ANGULUS, Mühlfeldt (Tellinula, *Chem.* Fabulina, *Gray.*)

Shell oblong, compressed, anterior side rounded, posterior side more or less angulated. Hinge with one lateral tooth in one valve.

australis, *Desh.*
compta, *Gould.*
corbuloides, *Hanley.*
culter, *Hanley*
cycladiformis, *Hanley.*
decora, *Say.*
delicatula, *Desh.*
exilis, *Lam.*
fabula, *Gmel.*
felix, *Hanley.*
Hiberna, *Hanley.*
hilaris, *Hanley.*
imbellis, *Hanley.*
inæqualis, *Hanley.*
incarnata, *Linn.*
insculpta, *Hanley.*
iridescens, *Bens.*
iris, *Say.*
juvenilis, *Hanley.*
lanceolata, *Chem.*
lauta, *Gould.*
lux, *Hanley.*
magna, *Spengl.*
margaritina, *Lam.*
Mars, *Hanley.*
mera, *Say.*
nitens, *Desh.*
Oudardi, *Payr.*

Philippinarum, *Hanley*.
polita, *Say*.
pumila, *Hanley*.
rhodon, *Hanley*.
rhodora, *Hinds*.
rubella, *Desh*.
rubra, *Desh*.
sanguinolenta, *Desh*.
similis, *Sow*.
solenella, *Desh*.
subrosea, *Hanley*.
tenera, *Say*.
Ticaonica, *Desh*.
Valtonis, *Hanley*.
vernalis, *Hanley*.
virgo, *Hanley*.

Sub-gen. TELLINIDES, Lamarck.

Shell oval, compressed, fold obsolete. Hinge with one approximate lateral tooth.

coccinea, *Chem*.
conspicua, *Hanley*.
emarginata, *Sow*.
ovalis, *Sow*.
planissima, *Anton*.
psammotella, *Lam*.
purpurascens, *Brod. and Sow*.
sinuata, *Spengl*.
Timorensis, *Lam*.
truncatula, *Sow*.
vestalis, *Hanley*.

Sub-gen. HOMALA, Mörch.

Shell oblong, compressed, inequivalve, very inequilateral; anterior side short and rounded, posterior side produced and rounded; fold obsolete. Hinge with one approximate lateral tooth in one valve.

acuminata, *Hanley*.
complanata, *Desh*.
hyalina, *Gmel*.
triangularis, *Chem*.

Sub-gen. PERONÆA, Poli (Psammotella, *Blainv*., not *Desh*. Omala, *Schum*.).

Shell oblong-oval, anterior side the shorter, posterior side acuminated. Hinge with the lateral teeth obsolete.

alba, *Quoy and Gaim*.
assimilis, *Hanley*.
Bodegensis, *Hinds*.
Columbiensis, *Hanley*.
cuspis, *Hanley*.
cygnus, *Hanley*.

dispar, *Conr.*
Gaimardi, *Desh.*
glabrella, *Desh.*
Japonica, *Desh.*
lutea, *Gray.*
micans, *Hanley.*
miles, *Hanley.*
nitida, *Poli.*
planata, *Linn.*
rufescens, *Chem.*
scalpellum, *Hanley.*
Souleyeti, *Hanley.*
strigosa, *Gmel.*
tenta, *Say.*
textilis, *Desh.*

Sub-gen. METIS, H. and A. Adams.

Shell sub-orbicular, compressed, surface of valves sulcate; hinder flexuosity sub-median. Lateral teeth wanting.

Meyeri, *Phil.*

Genus STRIGILLA, Turton.

Shell orbicular, convex, surface of valves divaricately striated; posterior flexure obsolete. Hinge with a small anterior, and a large bifid cardinal tooth in the right valve, and a single cardinal tooth in the left valve; lateral teeth two in each valve. Pallial impression with a deep, angular, siphonal inflection.

Ex. S. carnaria, *Linnæus*, pl. 104, fig. 1, 1, *a*.

This genus is readily recognised by its obliquely-sculptured valves and its orbicular shape.

Species of Strigilla.

carnaria, *Linn.*
cicercula, *Phil.*
flexuosa, *Say.*
obliquilineata, *Hanley.*
piciformis, *Linn.*
Rombergii, *Mörch.*
Senegalensis, *Hanley.*
sincera, *Hanley.*
splendida, *Anton.*

Genus MACOMA, Leach.

Animal with a single branchial lamella on each side.

Shell oval, convex or sub-ventricose. Hinge with the cardinal teeth small; no lateral teeth; ligament external. Pallial impression with a deep, wide sinus.

Ex. M. tenuis, *Da Costa*, pl. 104, fig. 2. Shell, M. solidula, *Pultney*, fig. 2, *a*, 2, *b*.

"The branchial apparatus," says Clark, "is curious, and a departure from the *Tellina* type; it consists of a single, rather elongated branchial plate on each side, situated towards the posterior half of the animal; it is fixed to the dorsal range by its base running obliquely, indeed almost vertically, from the dorsal to the ventral range, becoming joined to its fellow under the posterior and smaller part of the body by a permanent membrane." The palpi are very large and triangular.

Species of Macoma.

æqualis, *Desh.*
ala, *Hanley.*
ancilla, *Hanley.*
Aurora, *Hanley.*
Balthica, *Linn.*
Birmanica, *Phil.*
Bruguieri, *Hanley.*
calcarea, *Chem.*
callosa, *Desh.*
candida, *Lam.*
Chinensis, *Hanley.*
compressa, *Desh.*
concinna, *C. B. Adams.*
constricta, *Brug.*
contabulata, *Desh.*
crassula, *Desh.*
Cumana, *Costa.*
dilatata, *Desh.*
discolor, *Phil.*
Dombei, *Hanley.*
edentula, *Brod. and Sow.*
elongata, *Hanley.*
Fabricii, *Hanley.*
formosa, *Hanley.*
fragilis, *Fabr.*
frigida, *Hanley.*
fusca, *Say.*
Galathæa, *Lam.*

grandis, *Hanley.*
gubernaculum, *Hanley.*
immaculata, *Phil.*
inconspicua, *Brod. and Sow.*
inornata, *Hanley.*
irus, *Hanley.*
lata, *Gmel.*
lilium, *Hanley.*
lucerna, *Hanley.*
Mazatlanica, *Desh.*
Middendorffii, *Desh.*
mœsta, *Desh.*
Moretonensis, *Desh.*
nasuta, *Conr.*
nobilis, *Hanley.*
nymphalis, *Hanley.*
obliquaria, *Desh.*
oblonga, *Gmel.*
Pacifica, *Conr.*
pellucens, *Desh.*
pellucida, *Phil.*
petalum, *Valenc.*
plebeia, *Hanley.*
proxima, *Brown.*
secta, *Conr.*
solidula, *Pultn.*
sordida, *Couth.*
tenuis, *Da Costa.*
Süessoni, *Morch.*
truncata, *Jonas.*
truncatella, *Desh.*
umbonella, *Lam.*
ventricosa, *Desh.*

Genus TELLIDORA, Mörch.

Shell triangular, very inequivalve, the right valve concave; surface of valves plicate; beaks acute, laterally incurved; lateral slopes strongly produced and dentate at their edges. Hinge with two primary teeth in one valve, and one in the other; lateral teeth two in each valve.

Ex. T. Burnettii, *Broderip and Sowerby*, pl. 104, fig. 3, 3, *a*.

The shells included in this genus constitute a very peculiar form of *Tellinidæ*, having the aspect of a *Myodora*, but with the teeth of the hinge as in *Tellina*. The two recent species known are from West Columbia, Mazatlan, and the Gulf of California; there is an extinct species (*Tellina lunulata*) from the Pleistocene beds of South Carolina.

Species of Tellidora.

Burnettii, *Brod. and Sow.*
crystallina, *Chem.*

Genus GASTRANA, Schumacher.

Shell sub-equivalve, inequilateral, both valves convex; surface more or less striated or ridged tranversely, not invested with an epidermis. Hinge composed of two primary teeth in one valve, and one bifid tooth in the other; no lateral teeth; ligament external. Muscular and pallial impressions strongly marked, the former oblong and nearly equal, the latter with a very deep and wide sinus.

Syn. Capsa, part, *Brug.* Diodonta, *Desh.* Fragilia, *Desh.*

Ex. G. fragilis, *Linnæus*, pl. 104, fig. 4. Shell. G. fragilis, fig. 4, *a*, 4, *b*.

In this genus the mantle is open, the margins are fimbriated, and the siphons are separated to their bases; the gills are unequal, and the labial palps large and triangular. The species inhabit shallow water, boring in mud and clay, and not travelling about like the Tellens. They are found at the Cape, in Senegal, the Black Sea, Britain, Greenland, and the Mediterranean.

Species of Gastrana.

angulata, *Linn.*
fragilis, *Linn.*
Guinaica, *Chem.*
inflata, *Desh.*
polygona, *Chem.*
ventricosa, *Krauss.*

Genus LUCINOPSIS, Forbes and Hanley.

Mantle-margins plain; pedal opening contracted; foot pointed, basal.

Shell rather thin, compressed; valves with the inner

margins entire. Hinge with two laminar, diverging teeth in the right valve, and three teeth (the central bifid) in the left valve. Muscular impressions oval, polished; pallial sinus very deep, ascending.

Syn. Dosinia, *Gray*, not *Scop.* Mysia, *Gray*, not *Leach.* Cyclina, *Gray*, not *Desh.* Lajonkairia, *Desh.*

Ex. L. undata, *Pennant*, pl. 105, fig. 1. Shell, L. undata, fig. 1, *a*, 1, *b*.

The siphons in this genus resemble those of *Tellinidæ* rather than *Veneridæ*, being long, separate as far as their bases, and diverging, with the orifices fringed. The shell is also thin, and with the flexuosity of the Tellens, and there are but two teeth in one valve. Although usually placed in the family *Veneridæ*, we have preferred to follow, in this instance, the example of Mr. W. Clark, and to regard *Lucinopsis* as one of the *Tellinidæ*.

Species of Lucinopsis.

decussata, *Phil.*
gibbosa, *Gmel.*
inflata, *Sow.*
Kroyeri, *Phil.*
macilenta, *Reeve.*
saccata, *Gould.*
subquadrata, *Hanley.*
substriata, *Mont.*
tenuis, *Recluz.*
undata, *Penn.*

Sub-fam. DONACINÆ.

Animal with the siphons short and diverging.

Shell more or less wedge-shaped, closed. Hinge with the ligament short, external.

Genus DONAX, Linnæus.

Shell strong, more or less wedge-shaped, equivalve; the hinder side much shorter than the anterior; surface smooth,

radiato-striate or decussate, covered with an epidermis; inner margin of valves entire, or crenulated. Hinge composed of two cardinal teeth in one valve, and one bifid tooth in the other; one, or two lateral teeth in each valve; ligament short, external. Muscular impressions rounded or oblong; pallial sinus wide and deep.

Syn. Chione, *Scop.* Donaciarius, *Dum.* Egeria, *Lea*, not *Roissy*.

Ex. D. venustus, *Poli*, pl. 104, fig. 5. Shell, D. rugosus, *Linnæus*, fig. 5, *a*, 5, *b*.

The mantle in *Donax* is fringed at the margin, the siphons are short, thick, and diverging, the anal orifice is denticulated, the siphonal furnished with pinnate cirrhi, and the labial palps are small and pointed. The *Donaces* inhabit the sandy shores of all tropical countries; a few species are also from Northern Coasts, and several are natives of the British Islands; they are usually found buried a few inches beneath the surface, near low-water mark.

Species of Donax.

acuminatus, *Desh.*
assimilis, *Hanley.*
Cayennensis, *Lam.*
clathratus, *Desh.*
consanguineus, *C. B. Adams.*
denticulatus, *Linn.*
Dysoni, *Desh.*
flexuosus, *Gould.*
granifer, *Desh.*
Hanleyanus, *Phil.*
incarnatus, *Chem.*
introradiatus, *Reeve.*
lævigatus, *Desh.*
lubricus, *Hanley.*
Madagascariensis, *Wood.*
obesus, *D'Orb.*
obsesulus, *Desh.*
paxillus, *Reeve.*
rugosus, *Linn.*
semisulcatus, *Hanley.*
sordidus, *Reeve.*

Sub-gen. LATONA, Schumacher.

Shell ovate wedge-shaped, compressed posteriorly, abruptly truncate anteriorly; inner margin of valves entire.

abbreviatus, *Lam.*
australis, *Lam.*
bicolor, *Gmel.*
columbella, *Lam.*
compressus, *Lam.*
corbuloides, *Desh.*
cuneatus, *Linn.*
deltoides, *Lam.*
faba, *Chem.*
Lessoni, *Desh.*
Ticaonicus, *Hanley.*
tinctus, *Gould.*
trifasciatus, *Reeve.*
veneriformis, *Lam.*
vittatus, *Lam.*

Sub-gen. HECUBA, Schumacher (Donax, *Scop.*, not *Linn.*).

Shell triangular, sub-cordiform, anterior slope acute, flat; margin of valves not quite entire. Hinge with a lateral tooth on each side.

asper, *Hanley.*
carinatus, *Hanley.*
culminatus, *Cpr.*
dentifer, *Hanley.*
pubescens, *Linn.*
scortum, *Linn.*

Sub-gen. SERRULA, Chemnitz (Cuneus, *Gray*, not *Da Costa* or *Mühlfeldt*).

Shell ovate-triangular, wedge-shaped, gibbous anteriorly; margin of valves strongly denticulated. Hinge with the cartilage-fissure oblong.

æneus, *Mörch.*
affinis, *Desh.*
anatinus, *Lam.*
bellus, *Desh.*
bitinctus, *Reeve.*
Californicus, *Conr.*
Carpenteri, *H. and A. Adams* (semistriatus, *Cpr.*).
Conradi, *Desh.*
contusus, *Reeve.*

crocatus, *Gould.*
cultus, *Hanley.*
gracilis, *Hanley.*
incertus, *Reeve.*
Lamarckii, *Desh.*
lunularis, *Phil.*
navicula, *Hanley.*
nitidus, *Desh.*
petallinus, *Desh.*
pulchellus, *Hanley.*
punctatostriatus, *Hanley.*
saxulum, *Reeve.*
scalpellum, *Gray.*
semistriatus, *Poli.*
serra, *Chem.*
spiculum, *Reeve.*
transversus, *Sow.*
trunculus, *Linn.*
variabilis, *Say.*
vellicatus, *Reeve.*
venustus, *Poli.*

Sub-gen. CAPSELLA, Gray.

Shell ovate-oblong, transverse, rounded at both ends, covered with a greenish epidermis; margin of valves entire.

acutangulus, *Desh.*
Owenii, *Gray.*
politus, *Poli.*
variegatus, *Reeve.*

Sub-gen. HETERODONAX, Mörch (Arcopagia, *D'Orb.*, not *Leach*).

Shell broad, triangularly rounded, smooth. Hinge with lateral teeth in both valves.

bimaculatus, *Linn.*
nuculoides, *Reeve.*
obscurus, *Reeve.*
ovalinus, *Desh.*
ovalis, *Desh.*
parvus, *Dkr.*
vicinus, *C. B. Adams.*

Genus IPHIGENIA, Schumacher.

Shell transverse, sub-equilateral, closed, gibbous, covered with a thin, olivaceous epidermis; inner margin of valves not crenulated. Hinge with two primary teeth in the right valve, and one cardinal and two nearly obsolete lateral teeth

in the left valve; ligament external. Pallial impression sinuated.

Syn. Capsa, *Lam.*, 1818, not 1801. Donacina, *Férus.* Procos, *Gistel.*

Ex. I. lævigata, *Gmelin*, pl. 104, fig. 6, 6, *a*.

The species of *Iphigenia* are found in estuaries in Brazil, Central America, and Senegal; one species (*I. ventricosa*) has the beaks eroded, and the surface of the valves is rayed like *Galatea.*

Species of Iphigenia.

altior, *Sow.*
Braziliensis, *Lam.*
lævigata, *Gmel.*
media, *Shuttl.*
ventricosa, *Phil.*

Genus GALATEA, Bruguière.

Shell thick, solid, equivalve, sub-trigonal, covered with a thick, horny epidermis. Hinge with the cardinal teeth grooved, two in the right valve united at their bases; three in the left, the intermediate anterior and separate; lateral teeth two, remote; ligament short, external, prominent, tumid. Pallial line sinuated.

Syn. Egeria, *Roissy*, not *Lea.* Potamophila, *Sow.* Megadesma, *Bowdich.* Galateola, *Fleming.*

Ex. G. paradoxa, *Born*, pl. 105, fig. 2. Shell, G. paradoxa, fig. 2, *a*, 2, *b*.

The species of *Galatea*, which are all covered with a greenish epidermis, are few in number, and are found in the sandy flats of the Nile and the rivers of Western Africa, sometimes as far as twenty miles from the sea. The mantle of the animal is freely open, the margin is simple,

and the siphonal tubes are equal, elongate, and separate as far as their bases. The foot is large, oblong, compressed and sub-angular anteriorly.

Species of Galatea.

Bengoënsis, *Dkr.*
læta, *Phil.*
paradoxa, *Born.*
rubicunda, *Phil.*
tenuicula, *Phil.*
versicolor, *Morel.*

Sub-fam. SCROBICULARIINÆ.

Siphons elongate, separate, diverging.

Shell thin, sub-equivalve, gaping and often flexuous posteriorly. Hinge with the cartilage internal, situated in a cartilage-pit.

Genus SCROBICULARIA, Schumacher.

Shell compressed, sub-equivalve, nearly smooth, or marked by concentric grooves. Hinge with one or two small, narrow primary teeth in each valve, and a spathulate, triangular pit in each valve for the internal cartilage; lateral teeth none; ligament small, narrow, partially external. Muscular impressions round; pallial sinus ample.

Syn. Arenaria, *Mühlfeldt*, not *Linn.* Ligula, *Montagu.* Lavignonus, *Férus.* Listera, *Turt.* Lutricola, *Blainv.* Lutraria, *Swains.*, not *Lam.* Calcinella, *Desh.*

Ex. S. piperita, *Gmelin*, pl. 105, fig. 3. Shell, S. piperita, fig. 3, *a*, 3, *b*.

In this genus the orifices of the siphonal tubes are plain, the mantle margin is denticulated, and the foot is large and compressed. The animals usually live, buried vertically five or six inches deep, in the mud of tidal estuaries; the siphons can be extended five or six times the length of the shell. The species are found in Norway, Britain, the Mediterranean, Senegal, India, China, and the Philippines.

Species of Scrobicularia.

borealis, *Pfeiff.*
Cottardi, *Payr.*
piperita, *Gmel.*
Sicula, *Sow.*

Sub-gen. CAPSA, Bosc.

Shell ovate or sub-triangular, posterior side short, flexuous. Hinge with the cardinal teeth small and laminar; lateral teeth none.

alta, *Conr.*
angulata, *Chem.*
biangulata, *Cpr.*
Chemnitzii, *Desh.*
contorta, *Desh.*
Deshayesii, *H. and A. Adams* (spectabilis, *Desh.*).
ephippium, *Spengl.*
inflata, *Schum.*
lacunosa, *Chem.*
obesa, *Desh.*
plebeia, *Hanley.*
producta, *Cpr.*
spectabilis, *Hanley.*
trigonalis, *Adams and Reeve.*
turgida, *Desh.*

Sub-gen. IACRA, H. and A. Adams.

Shell sub-trigonal, surface of the valves divaricately sulcate, posterior flexure strong.

Seychellarum, *A. Adams.*

Genus ABRA, Leach.

Shell thin, transversely elongated, slightly gaping at the sides; surface smooth, covered with a thin, deciduous epidermis. Hinge with an oblique cartilage-pit for the internal cartilage; primary teeth small, or wanting; lateral teeth distinct; ligament short, partly external. Muscular impressions rounded; pallial line deeply and widely sinuated.

Syn. Erycina, *Lam.*, not *Recluz.* Syndosmya, *Recluz.*

Ex. A. intermedia, *Thompson*, pl. 105, fig. 4. Shell, A. tenuis, *Montagu*, fig. 4, *a*, 4, *b*.

The species of *Abra* are few, and mostly boreal in their geographical distribution. They range from the laminarian zone to one hundred and eighty fathoms, living buried in sand and mud. The species are found in Norway, Britain, the Mediterranean, and the Black Sea.

Species of Abra.

alba, *Wood.*
intermedia, *Thomp.*
prismatica, *Mont.*
segmentina, *Recluz.*
tenuis, *Mont.*

Genus SEMELE, Schumacher.

Shell transversely oval or orbicular, slightly gaping at the sides. Hinge with one or two primary teeth in each valve, with a long, narrow pit between them for the internal cartilage; ligament external, thin. Muscular impressions round; pallial line with a wide and deep sinus.

Syn. Amphidesma, *Lamarck.*

Ex. S. reticulata, *Sowerby*, pl. 105, fig. 5, 5, *a*.

The species of this genus are found buried in the sand on the sea-coasts of Australia, China, South America, India, and the West Indies. The surface of the valves is frequently concentrically lamellated, and ornamented with delicate and beautiful sculpture.

Species of Semele.

amabalis, *A. Adams.*
amœna, *A. Adams.*
australis, *Sow.*
bicolor, *C. B. Adams.*
Californica, *A. Adams.*
cancellata, *Sow.*
carnicolor, *Hanley.*
casta, *A. Adams.*
compta, *A. Adams.*
cordiformis, *Chem.*
corrugata, *Sow.*
crenulata, *Sow.*
crocea, *Gould.*
decisa, *Conr.*
decora, *A. Adams.*
decussata, *Wood.*
deformis, *Phil.*
duplicata, *Sow.*
elliptica, *Sow.*
exarata, *Adams and Reeve.*
formosa, *Sow.*
Gruneri, *A. Adams.*
icterica, *Reeve.*
Jovis, *A. Adams.*
jucunda, *A. Adams.*
Jukesii, *A. Adams.*
læta, *A. Adams.*
lævis, *Sow.*
lamellosa, *Sow.*
lenticularis, *Sow.*
luteola, *A. Adams.*
Martinii, *A. Adams.*
modesta, *A. Adams.*
obliqua, *Wood.*
orbiculata, *Say.*
pallida, *Sow.*
proxima, *C. B. Adams.*
pulchella, *A. Adams.*
pulchra, *Sow.*
punctata, *Sow.*
purpurascens, *Sow.*
radiata, *Rüpp.*
reticulata, *Sow.*
rosea, *Sow.*
rubrolineata, *Conr.*
rupium, *Sow.*
scabra, *Hanley.*
simplex, *Adams and Reeve.*
Sinensis, *A. Adams.*
solida, *Gray.*
sponsa, *A. Adams.*
striata, *Rüpp.*
subtruncata, *Sow.*
tortuosa, *C. B. Adams.*
ventricosa, *C. B. Adams.*
venusta, *A. Adams.*
vestalis, *A. Adams.*
virginea, *A. Adams.*
Zebuensis, *Hanley.*

Genus CUMINGIA, Sowerby.

Shell equivalve, inequilateral, anteriorly rounded, posteriorly sub-truncate and slightly gaping. Hinge with a small, anterior primary tooth in each valve; cartilage internal, in a spoon-shaped cavity projecting into the cavity of the valves; one strong lateral tooth on each side of the hinge in one valve, no lateral teeth in the other. Anterior muscular impression irregular and oblong, posterior rounded; pallial line with a very large sinus.

Ex. C. mutica, *Sowerby*, pl. 105, fig. 6, 6, *a*.

The species of *Cumingia* are usually found in sponges, sand, and the fissures of rocks; the valves, in consequence, often assume an irregular aspect. Examples of the genus have occurred in Australia, the Philippine Islands, India, Western America, and the West Indies.

Species of Cumingia.

Antillarum, *D'Orb.*
Californica, *Conr.*
Clerii, *A. Adams.*
coarctata, *Sow.*
fragilis, *A. Adams.*
lamellosa, *Sow.*
mutica, *Sow.*
Petitiana, *D'Orb.*
similis, *A. Adams.*
sinuosa, *A. Adams.*
striata, *A. Adams.*
tellinoides, *Conr.*
tenuis, *H. and A. Adams* (Antillarum, *A. Adams*).
trigonularis, *Sow.*

Sub-fam. PAPHIINÆ.

Animal with the siphons separate and diverging.

Shell equivalve, closed, with the cartilage in an internal pit, and with a simple, compressed primary tooth, and a rudimentary process in the place of the second tooth.

Genus PAPHIA, Lamarck.

Shell ovate, sub-trigonal, truncated and slightly keeled behind. Hinge with the lateral teeth small, sub-equal, smooth. Siphonal inflection distinct.

Syn. Eryx, *Swainson*, not *Daud.*

Ex. P. glabrata, *Gmelin*, pl. 106, fig. 1, 1, *a*.

The shells of this genus are triangular and more equilateral than in *Donacilla* or *Mesodesma*; the species are found in the sands in various parts of the world.

Species of Paphia.

glabrata, *Gmel.*
intermedia, *Desh.*
Layardi, *Desh.*
macrodon, *Desh.*
mitis, *Desh.*
striata, *Gmel.*
sulcata, *Desh.*
trigona, *Desh.*

Sub-gen. TARIA, Gray.

Shell oblong, sub-equilateral, attenuated behind, hinder slope keeled; lateral teeth very small. Siphonal inflection distinct.

lata, *Desh.*
spissa, *Reeve.*

Genus MESODESMA, Deshayes.

Shell ovate, sub-equilateral. Hinge with the lateral teeth short, smooth, sub-equal. Siphonal inflection distinct.

Syn. Machæna, *Leach.*

Ex. M. Novæ Zelandiæ, *Chemnitz*, pl. 106, fig. 2, 2, *a*.

The shells comprised in this genus are usually, when in a

fresh state, covered with a thick, greenish-brown epidermis, and are transversely ovate. They inhabit the sands of estuaries in New Zealand and other parts of the world.

Species of Mesodesma.

erycinea, *Lam.*
mactroides, *Desh.*
Novæ Zelandiæ, *Chem.*
ovalis, *Desh.*

Genus CERONIA, Gray.

Shell ovate-cuneate, truncated behind. Hinge with the lateral teeth sub-equal, compressed, strongly cross-grooved. Siphonal inflection distinct.

Ex. C. Jouresii, *Joannis*, pl. 106, fig. 3, 3, *a*.

The species of *Ceronia*, at present discovered, are rugose and covered with an epidermis; the lateral teeth are curiously grooved. They are from California.

Species of Ceronia.

arctata, *Conr.*
donacia, *Lam.*
Jouresii, *Joannis.*
lanceolata, *Desh.*

Genus DONACILLA, Lamarck.

Shell elongate, wedge-shaped, hinder slope truncated. Hinge with the anterior lateral teeth elongate, the hinder short. Siphonal inflection distinct.

Syn. Donacina, *Blainv.*

Ex. D. cornea, *Poli*, pl. 106, fig. 4. Shell, D. cornea, fig. 4, *a*, 4, *b*.

The West Indies, the Mediterranean, the Crimea, India, New Zealand, and Chili harbour examples of this genus, the shells of which are usually more or less wedge-shaped.

Species of Donacilla.

angulus, *Desh.*
angusta, *Desh.*
cornea, *Poli.*
elongata, *Desh.*
heterodon, *Desh.*
nitida, *Desh.*
præcisa, *Desh.*
transversa, *Desh.*

Genus ANAPA, Gray.

Shell sub-trigonal, ventricose, truncated behind. Hinge with the lateral teeth sub-equal, compressed, smooth. Siphonal inflection none.

Ex. A. triquetra, *Hanley*, pl. 106, fig. 5, 5, *a*.

In this and the following genus *Davila* there is an entire absence of any sinuosity in the pallial line. The two species of *Anapa* known are found in New Zealand and Van Dieman's Land.

Species of Anapa.

cuneata, *Desh.*
triquetra, *Hanley*.

Genus DAVILA, Gray.

Shell ovate-cuneate, truncated behind. Hinge with the lateral teeth unequal, the anterior small and perpendicular. Siphonal inflection none.

Ex. D. crassula, *Deshayes*, pl. 106, fig. 6, 6, *a*.

The form of the shell in *Davila*, which is ovate and

compressed, serves to distinguish it from *Anapa*, where the shell is trigonal and ventricose. *D. plana* is from the Philippines.

Species of Davila.

crassula, *Desh.*
plana, *Hanley.*
retusa, *Desh.*

Genus ERVILIA, Turton.

Shell equivalve, inequilateral, oblong, closed; surface nearly smooth, or transversely striated. Hinge with two diverging teeth in each valve, one of them, in the right valve, elevated and conspicuous; cartilage internal, in a cartilage-pit in each valve; lateral teeth none. Muscular impressions strong; pallial sinus large and broad.

Ex. E. castanea, *Montagu*, pl. 106, fig. 7, 7, *a*.

The species of *Ervilia* known are from deep water, and inhabit the West Indies, Britain, the Canaries, and the Mediterranean and Red Seas.

Species of Ervilia.

castanea, *Mont.*
nitens, *Mont.*

Fam. VENERIDÆ.

Labial palps small, triangular, acute. Mantle with a somewhat large pedal opening; siphons short, unequal, united for the greater part of their length; gills large, subquadrangular, united behind. Foot large, compressed, linguiform, sometimes furnished with a byssal groove.

Shell regular, free or perforating, closed or somewhat

gaping. Hinge usually composed of three diverging primary or cardinal teeth in each valve; cartilage external, marginal. Muscular impressions smooth, oval; pallial line sinuated.

Animal marine, locomotive or burrowing.

Sub-fam. VENERINÆ.

Siphons free at their extremities. Foot lanceolate, without a byssal groove.

Shell ovate, sub-trigonal. Hinge with the cardinal teeth triangular, and with an anterior lateral tooth.

Genus VENUS, Linnæus.

Mantle-margins fringed or furbelowed; siphons unequal, separate, diverging, the branchial with a double row of cirrhi, the inner one long and simple, the outer shorter, furcate or stellate; anal siphon conical, crowned with short cirrhi.

Shell thick, ovate, tumid; valves transversely grooved or lamellated, margins finely crenulated; lunule distinct. Hinge thick, tri-dentate in each valve; primary teeth nearly equal, divaricate, the apex sometimes bifid. Pallial line with a short, angular sinus.

Syn. Omphaloclathrum, *Klein.* Antigona, *Schum.* Dosina, *Gray.*

Ex. V. verrucosa, *Linnæus*, pl. 107, fig. 1. Shell, V. verrucosa, fig. 1, *a*, 1, *b*.

The shells in this genus are either verrucose or ornamented with concentric ribs or striæ, or with lamellæ, or they are decussated by longitudinal furrows. The species

are world-wide in their geographical distribution; the British Islands and Northern Ocean, the Mediterranean and Red Seas, Australia, and the Cape of Good Hope, all affording us examples. They are usually found buried in the sand at low-water, though some species range as deep as one hundred fathoms. Although not generally employed as food, they are all edible. Extinct examples are numerous in the Oolites of India, the United States, and Patagonia.

Species of Venus.

affinis, *Sow.*
antiqua, *King.*
casina, *Linn.*
Chemnitzii, *Desh.*
cingulata, *Lam.*
clathrata, *Desh.*
consobrina, *Desh.*
crebrisulca, *Lam.*
crenulata, *Chem.*
crispata, *Desh.*
declivis, *Sow.*
Dombei, *Lam.*
effossa, *Phil.*
foveolata, *Sow.*
Isabelleana, *D'Orb.*
Jukesii, *Desh.*
lacerata, *Hanley.*
lamellaris, *Schum.*
laqueata, *Sow.*
Listeri, *Gray.*
lyra, *Hanley.*
magnifica, *Hanl.*
monilifera, *Sow.*
multicostata, *Sow.*
nodulosa, *Sow.*
oblonga, *Hanley.*
puerpera, *Linn.*
pulicaria, *Brod.*
resticulata, *Sow.*
reticulata, *Linn.*
rosalina, *Rang.*
rugosa, *Chem.*
sculpta, *Desh.*
Sowerbyi, *Desh.*
tuberosa, *Desh.*
verrucosa, *Linn.*

Genus MERCENARIA, Schumacher.

Shell ventricose, sub-globose, triangularly heart-shaped; valves with the margins finely crenulated. Hinge with three erect, compressed, diverging teeth in each valve, the

anterior in the left, and the posterior in the right valve strong and somewhat bifid, the others simple and lamellar; lozenge prominent, obliquely sulcately crenate within. Pallial line remote from the ventral margin, ending behind in a short, narrow, triangular sinus.

Ex. M. violacea, *Schumacher*, pl. 107, fig. 2, 2, *a*.

There are but few species of *Mercenaria* described, all from the shores of America. The valves of the shell appear to be regarded with much interest by the Red men, being used as ornaments for their dresses, and strung on leathern thongs as treaty-belts or wampum.

Species of Mercenaria.

Mortoni, *Conr.*
notata, *Say.*
præparca, *De Kay.*
violacea, *Schum.*

Genus GEMMA, Deshayes.

Shell roundly triangular, sub-equilateral; surface of valves smooth, the margins crenulated. Hinge short, narrow, with three primary teeth in the left valve, the middle one conical and slightly arched, and two in the right valve, diverging, with a wide pit between them; ligament external. Muscular impressions ventral; pallial line marginal, with a very long, narrow, deep sinus ascending perpendicularly.

Ex. G. gemma, *Totten*, pl. 107, fig. 3, 3, *a*.

This genus is founded on a pretty little shell from the United States of America, in which there are only two primary teeth in the right valve, and where the sinus of the pallial impression is deep and angular, as in *Dosinia*.

Genus CRYPTOGRAMMA, Mörch.

Shell triangular, ventricose, produced and beaked behind. Hinge composed of two primary teeth in the left valve, the anterior conical, acute, and sub-recurved, the hinder linear, parallel, and under the lozenge; and two primary teeth in the right valve, the anterior compressed, erect, and obtuse, the hinder triangular and decumbent; lozenge small, crenulate within. Pallial line with a shallow, triangular, nearly obsolete sinus.

Syn. Anomalocardia, *Schum.*, not *Klein.* Triquetra, *Blainv.*, not *Klein.*

Ex. C. flexuosa, *Linnæus*, pl. 107, fig. 4, 4, *a*.

The animal of *Cryptogramma* is unknown; the shell is thick, solid, triangular and wedge-shaped, without concentric lamellæ; the internal margin of the valves is crenate; there are no anterior lateral teeth, and the cardinal teeth are triangular.

Species of Cryptogramma.

flexuosa, *Linn.*
impressa, *Hanley.*
macrodon, *Lam.*
rostrata, *Sow.*
squamosa, *Linn.*
subimbricata, *Sow.*
subrugosa, *Sow.*

Genus CHIONE, Megerle von Mühlfeldt.

Mantle-margins plicato-dentate; siphons, short, broad, unequal, and united at the base, the branchial with two rows of cirrhi, the anal ciliated.

Shell ovately triangular, more or less thickened or sub-

cordiform; margins of the valves finely crenulated. Hinge narrow, solid, tri-dentate in the right valve, bi-dentate in the left; teeth divaricate, unequal, the anterior tooth the longest; ligament narrow, external. Pallial line with the sinus nearly obsolete, or very short and triangular.

Ex. C. fasciata, *Da Costa*, pl. 107, fig. 5. Shell, C. Gnidia, *Broderip* and *Sowerby*, 5, *a*, 5, *b*.

In this genus the animal is ovately triangular; the anal siphon is furnished with a conical valve; the gills are broad, unequal, sub-quadrangular, widely plicate, and united posteriorly; the labial palps are small and triangular; and the foot is compressed and trigonal. The surface of the shell, which varies in form, is lamellar, cancellated, smooth, or transversely striated; there are no anterior lateral teeth, and the primary teeth are triangular. The species of *Chione* are numerous, and are widely distributed, being met with in the seas of most tropical and temperate countries.

Species of Chione.

Amathusia, *Phil.*
cælata, *Mke.*
Californiensis, *Brod.*
callosa, *Conr.*
cancellata, *Gronov.*
Cochinensis, *Sow.*
Columbiensis, *Sow.*
compta, *Sow.*
costata, *Quoy and Gaim.*
costellifera, *Adams and Reeve.*
crenifera, *Sow.*
decorata, *Brod. and Sow.*
fluctifraga, *Sow.*
Gnidia, *Brod. and Sow.*
imbricata, *Sow.*
lima, *Sow.*
marica, *Linn.*
neglecta, *Sow.*
Nuttallii, *Conr.*
ornatissima, *Brod.*
ovata, *Penn.*
pygmæa, *Lam.*
ruderata, *Desh.*
scabra, *Wood.*
simillima, *Sow.*
striatissima, *Sow.*
Stutchburyi, *Gray.*
tumida, *Sow.*

Sub-gen. CIRCOMPHALUS, Klein (Clausina, *Brown*, Clausinella, *Gray*).

Shell with the surface of the valves lamellose, the lamellæ membranaceous, or short and thickened.

alta, *Sow.*
Berrii, *Gray.*
calcarea, *Phil.*
calophylla, *Hanley.*
chlorotica, *Mke.*
Cumingii, *Sow.*
Cypria, *Sow.*
decipiens, *Hanley.*
discrepans, *Sow.*
distans, *Phil.*
dysera, *Linn.*
elegans, *Adams and Reeve.*
fasciata, *Da Costa.*
foliacea, *Phil.*
gilva, *Phil.*
Isabellina, *Phil.*
Kelletii, *Hinds.*
lamellata, *Lam.*
Paphia, *Linn.*
Peruviana, *Sow.*
puella, *Phil.*
retroversa, *Desh.*
roborata, *Hanley.*
tiara, *Dillw.*
varicosa, *Sow.*
Yatei, *Gray.*

Sub-gen. TIMOCLEA, Leach.

Shell with the surface of the valves decussated.

aspera, *Quoy and Gaim.*
australis, *Sow.*
cardioides, *Lam.*
discors, *Sow.*
fuscolineata, *Brod. and Sow.*
gallinula, *Lam.*
granulata, *Gmel.*
grata, *Say.*
histrionica, *Brod. and Sow.*
intersecta, *Sow.*
mitis, *Desh.*
pectorina, *Lam.*
straminea, *Sow.*
subnodulosa, *Hanley.*
tessellata, *Adams and Reeve.*
undatella, *Sow.*

Sub-gen. CHAMELEA, Klein (Pectunculus, *Da Costa*, not *Lam.* Orthygia, *Leach*).

Shell with the surface of the valves transversely striated.

aphrodina, *Desh.*
aphrodinoides, *Lam.*

astartoides, *Beck.*
cor, *Sow.*
elegantina, *Lam.*
gallina, *Linn.*
hiantina, *Lam.*
Japonica, *Gmel.*
mesodesma, *Quoy and Gaim.*
pallida, *Turt.*
Peronii, *Lam.*
Philippii, *Desh.*
polita, *Quoy and Gaim.*
recens, *Chem.*
regularis, *Desh.*
rimularis, *Lam.*
scalarina, *Lam.*
striata, *Chem.*
striatula, *Da Costa.*
tristis, *Lam.*

Sub-gen. MARCIA, H. and A. Adams.

Shell with the surface of the valves smooth.

ambigua, *Desh.*
Ceylonensis, *Sow.*
Creplini, *Dkr.*
exalbida, *Chem.*
fumigata, *Sow.*
interrupta, *Koch.*
Kochii, *Phil.*
Kraussii, *Desh.*
lenticularis, *Sow.*
marmorata, *Lam.*
obovalis, *Desh.*
pinguis, *Chem.*
quadrangularis, *Adams and Reeve.*
radiata, *Chem.*
undulosa, *Lam.*
ustulata, *Desh.*

Genus MERETRIX, Lamarck.

Mantle-margins plain; siphons united half-way.

Shell ovately sub-triangular, thick, smooth; margins of valves simple, entire. Hinge thickened, tri-dentate, the anterior lateral tooth contiguous, beneath the lunule, the hinder lateral teeth crenulated. Pallial line simple, or posteriorly slightly sinuated.

Syn. Cytherea, *Lamarck.* Nympha, *Martini.*

Ex. M. impudica, *Lamarck,* pl. 107, fig. 6, 6, *a.*

The shell in this genus is solid, usually more or less transversely oblong, with slightly prominent beaks; the

surface of the valves is sometimes sulcated or transversely striated, but is usually smooth, and the internal margin of the valves is entire. The hinge is generally composed of four diverging teeth in one valve and three in the other, with corresponding pits, and the ligament is external and prominent. The genus includes many recent species, being represented in most seas. Australia, China, India, Europe, and Western America afford examples.

Species of Meretrix.

casta, *Gmel.*
castanea, *Lam.*
corpulenta, *Gray.*
formosa, *Sow.*
fusca, *Phil.*
graphica, *Lam.*
grata, *Desh.*
hieroglyphica, *Conr.*
impudica, *Lam.*
Lamarckii, *Desh.*
lusoria, *Chem.*
lyrata, *Sow.*
mitis, *Gray.*
morphina, *Lam.*
ovum, *Hanley.*
petechialis, *Lam.*
Philippinarum, *Hanley.*
triradiata, *Gmel.*
zonaria, *Lam.*

Sub-gen. GOMPHINA, Mörch.

Shell sub-triangular, sub-equilateral, slopes nearly straight, ventral edge arcuated. Hinge with three approximate cardinal teeth in one valve, two and a rudimentary one in the other; no lateral teeth.

donacina, *Chem.*

Genus CALLISTA, Poli.

Mantle-margins plicate, with filaments above the base of the respiratory siphon; siphons united to their ends, crowned with simple cirrhi.

Shell transverse, ovate, inequilateral, closed; margins of valves entire, often obtuse. Hinge tri-dentate in the left valve, the anterior lateral tooth united to the lunular tooth. Pallial line with a wide, deep, semi-ovate sinus.

Syn. Chione, *Gray*, not *Mühlfeldt*. Dione, *Gray*.

Ex. C. Chione, *Linnæus*, pl. 108, fig. 1. Shell, C. Dione, *Linnæus*, fig. 1, *a*, 1, *b*.

In this genus the form of the animal is ovate-oblong; the labial appendages are triangular, narrow, and acuminated; the gills are elongated, unequal, transverse, posteriorly united and acuminate, the outer ones the narrowest; and the foot is large, compressed, and linguiform. The shell is either sub-orbicular and inflated, or ovate and trigonal; and the surface of the valves is either smooth, sulcated, striated, or lamellose.

Species of Callista.

acuminata, *Sow.*
affinis, *Brod.*
albida, *List.*
albocincta, *Sow.*
angulifera, *Sow.*
aurantia, *Hanley.*
Belcheri, *Sow.*
brevispinata, *Sow.*
bullata, *Sow.*
candida, *Desh.*
Chinensis, *Chem.*
Chione, *Linn.*
circinata, *Born.*
citrina, *Lam.*
concinna, *Sow.*
consanguinea, *Sow.*
convexa, *Say.*
cor, *Wood.*
cordiformis, *Dkr.*
costata, *Chem.*
crocea, *Desh.*
cygnus, *Lam.*
Diemensis, *Hanley.*
Dione, *Linn.*
disrupta, *Sow.*
Erycina, *Linn.*
festiva, *Sow.*
florida, *Lam.*
floridella, *Gray.*
fluctuata, *Sow.*
gibbosula, *Desh.*
gigantea, *Chem.*
grata, *Desh.*
Grayi, *Desh.*
Hagenowi, *Dkr.*
hebræa, *Lam.*

impar, *Lam.*
indecora, *Phil.*
inflata, *Sow.*
innocens, *Sow.*
Kingii, *Gray.*
læta, *Linn.*
Lamarckii, *Gray.*
lilacina, *Lam.*
limatula, *Sow.*
lupanaria, *Less.*
maculata, *Linn.*
Manillæ, *Sow.*
minuta, *Koch.*
modesta, *Sow.*
multiradiata, *Sow.*
multispinosa, *Sow.*
multistriata, *Sow.*
nobilis, *Reeve.*
obesa, *Sow.*
obliquata, *Wood.*
pallescens, *Sow.*
pannosa, *Sow.*
pellucida, *Lam.*
phasianella, *Desh.*
Philippii, *Desh.*
piperita, *Sow.*
planatella, *Lam.*
pudica, *Mke.*
pura, *Desh.*
purpurata, *Lam.*
rosea, *Brod. and Sow.*
rostrata, *Koch.*
rudis, *Poli.*
rufescens, *Desh.*
rutila, *Sow.*
simplex, *Sow.*
sphericula, *Desh.*
squalida, *Sow.*
subinflata, *Sow.*
subpellucida, *Sow.*
suppositrix, *Mke.*
tellinæformis, *Phil.*
tessellata, *Homb. and Jacq.*
tortuosa, *Brod.*
tumens, *Gmel.*
umbonella, *Lam.*
unicolor, *Sow.*
varians, *Wood.*
virgo, *Gray.*
vulnerata, *Brod.*

Genus TIVELA, Link.

Shell triangular, cuneiform, sub-equilateral, inferiorly acute; margins of the valves entire. Hinge 3–5 dentate in one valve, 4–6 dentate in the other; anterior lateral tooth narrow, elongated, compressed. Pallial impression posteriorly sinuated; sinus short, oblique, or somewhat horizontal.

Syn. Trigona, *Mühlfeldt.* Trigonella, *Conr.*, not *Da Costa* or *Llhwyd.* "Le Tivel," *Adanson.*

Ex. T. tripla, *Linnæus*, pl. 108, fig. 2, 2, *a*.

The shells in this genus are usually thin, gibbous, and triangular, the beaks are very prominent, the lunule is indistinct, the internal margin of the valves is entire, and the hind cardinal tooth of the hinge is torn and divided. There are about twenty-nine species described, from the West Indies, the Mediterranean, Senegal, the Cape, India, and Western America. Fossil species occur in the Miocene of Bordeaux.

Species of Tivela.

æquilatera, *Desh.*
ambigua, *Desh.*
argentina, *Sow.*
bicolor, *Gray.*
compressa, *Sow.*
crassatelloides, *Conr.*
damaoides, *Gray.*
Dillwynii, *Desh.*
dolabella, *Sow.*
fulminata, *Phil.*
gracilior, *Sow.*
Hanleyana, *Sow.*
Hindsii, *Hanley.*
humilis, *Cpr.*
incerta, *Sow.*
intermedia, *Sow.*
lævigata, *Gray.*
lineata, *Sow.*
mactroides, *Born.*
nitidula, *Lam.*
planulata, *Brod. and Sow.*
polita, *Sow.*
radiata, *Sow.*
stultorum, *Gray.*
trigonella, *Lam.*
tripla, *Linn.*
undulata, *Sow.*
ventricosa, *Gray.*
virginea, *Adams and Reeve.*

Genus SUNETTA, Link.

Shell ovately trigonal, sub-equilateral, compressed, posterior side the shortest; lunule lanceolate, the area deeply excavated; margins thin and regularly denticulate. Hinge narrow, bi-dentate in one valve, tri-dentate in the other; anterior lateral tooth narrow, affixed to the hinge-margin.

Pallial impression posteriorly sinuated; sinus narrow, semi-oval.

Syn. Cuneus, *Mühlf.*, not *Da Costa*. Meroë, *Schum.* Cytherea, *Sow.*, not *Lam.*

Ex. S. Meroë, *Linnæus*, pl. 108, fig. 3, 3, *a*.

The animal of *Sunetta* is unknown. The shell is transversely oblong, the lunule very deep with sharp edges, the internal margin of the valves is crenate, and the hinge has the hind cardinal tooth torn and cross-grooved; the surface of the valves is either smooth or sulcate. Eleven species are known, chiefly from Senegal, India, Japan, and Australia.

Species of Sunetta.

Birmanica, *Phil.*
effossa, *Hanley*.
excavata, *Hanley*.
menstrualis, *Mke.*
Meroë, *Linn.*
scripta, *Linn.*
seminuda, *Phil.*
Solandri, *Gray*.
subquadrata, *Sow.*
truncata, *Desh.*
vaginalis, *Mke.*

Genus CIRCE, Schumacher.

Shell ovate, or sub-trigonal, often lentiform, beaks depressed; margins of valves entire, or sometimes crenulated. Hinge tri-dentate; teeth unequal, diverging, lunular tooth compressed, separate from the hinge-margin. Pallial impression simple.

Ex. C. scripta, *Linnæus*, pl. 108, fig. 4, 4, *a*.

In the genus *Circe* the shell is more or less triangular, solid, equivalve, and closed; the surface of the valves is smooth, or concentrically striated or grooved; the beaks are often curiously depressed, and not very prominent; and

the lunule is distinct, with smooth margins. The hinge is composed of three primary teeth and a lateral lamina in each valve; the ligament is external and linear; the muscular impressions are roundish or oblong, and there is hardly any trace of sinuation in the pallial line.

Species of Circe.

abbreviata, *Lam.*
æquivoca, *Chem.*
albida, *Desh.*
Arabica, *Chem.*
Artemis, *Desh.*
australis, *Sow.*
callipyga, *Born.*
corrugata, *Chem.*
Cracherodii, *Gray.*
crocea, *Gray.*
dispar, *Chem.*
divaricata, *Chem.*
elegans, *Sow.*
Gibbia, *Lam.*
lenticularis, *Desh.*
lentiginosa, *Chem.*
margarita, *Cpr.*
nummulina, *Lam.*
oblonga, *Desh.*
pectinata, *Linn.*
personata, *Lam.*
planata, *Gray.*
rivularis, *Born.*
scripta, *Linn.*
Stutzeri, *Donov.*
subtrigona, *Cpr.*
sulcata, *Gray.*
transversaria, *Desh.*
tumefacta, *Sow.*

Sub-gen. LIOCONCHA, Mörch.

Shell sub-trigonal, turgid, smooth, shining; beaks cordate.

castrensis, *Linn.*
fastigiata, *Sow.*
hebræa, *Sow.*
implexa, *Martyn.*
minor, *Desh.*
ornata, *Dillw.*
polita, *Born.*
trimaculata, *Lam.*

Sub-fam. DOSINIINÆ.

Siphons united. Foot sub-quadrangular, without a byssal groove.

Shell orbicular. Sinus of pallial impression oblique, triangular.

Genus DOSINIA, Scopoli.

Animal orbicular, compressed; mantle-margin plicate; foot sub-quadrangular.

Shell orbicular, compressed, concentrically striated, deeply lunulate under the beaks. Hinge with three teeth in each valve, the lunular tooth elongate and compressed; ligament external, partially concealed under the lozenge. Sinus of pallial impression deep, oblique, triangular, with the apex acuminate.

Syn. Artemis, *Poli*. Arthemis, *Blainv*. Orbiculus, *Mühlf*. Exoleta, *Brown*. Asa, *Leach*. Arctoë, Taras, *Risso*.

Ex. D. lupina, *Linnæus*, pl. 108, fig. 5. Shell, D. exoleta, *Linnæus*, fig. 5, *a*, 5, *b*.

The united siphons and large, lunate, inferior foot of the animal, and the orbicular, concentrically-striated shell, without any anterior tooth under the lunule, and with a deep and angular siphonal inflection, serve to characterise this genus. While in *Venus* and its sub-genera we find the cancellated or festooned style of ornament to predominate, and in *Meretrix* the smooth and painted style to prevail, the surface of the valves in *Dosinia* is usually concentrically grooved, and of a white or pale color. The species range from low-water to eighty fathoms, and are found both

in boreal and tropical seas; Europe, China, Japan, Africa, Australia, and America, all furnishing examples.

Species of Dosinia.

affinis, *Desh.*
Africana, *Gray.*
alata, *Reeve.*
alta, *Dkr.*
altior, *Desh.*
amphidesmoides, *Reeve.*
angulosa, *Phil.*
Annæ, *Darby.*
anus, *Phil.*
aspera, *Reeve.*
bilunulata, *Hanley.*
bis-cocta, *Reeve.*
cælata, *Reeve.*
cærulea, *Reeve.*
calculus, *Reeve.*
canaliculata, *Sow.*
circinaria, *Desh.*
compta, *Lovén.*
concentrica, *Born.*
concinna, *Sow.*
consobrina, *Desh.*
contracta, *Phil.*
contusa, *Reeve.*
corrugata, *Reeve.*
Coryne, *A. Adams.*
cretacea, *Reeve.*
crocea, *Desh.*
Cumingii, *Reeve.*
Cydippe, *A. Adams.*
Deshayii, *A. Adams.*
dilatata, *Phil.*
dilecta, *A. Adams.*
discus, *Reeve.*
distans, *Sow.*
Dunkeri, *Phil.*
elegans, *Conr.*
Eunice, *A. Adams.*
exasperata, *Phil.*
excisa, *Chem.*
exoleta, *Linn.*
ferruginea, *Reeve.*
fibula, *Reeve.*
glauca, *Reeve.*
grata, *Desh.*
Gruneri, *Phil.*
Hanleyana, *H. and A. Adams* (simplex, *A. Adams*).
hepatica, *Lam.*
incisa, *Reeve.*
isocardia, *Dkr.*
Japonica, *Reeve.*
juvenis, *Chem.*
laminata, *Reeve.*
lenticularis, *Sow.*
limbata, *Gould.*
lincta, *Pultn.*
lineolata, *A. Adams.*
livida, *Phil.*
lucinalis, *Lam.*
lucinoides, *Reeve.*
lupina, *Linn.*
modesta, *Reeve.*
nanus, *Reeve.*
nitens, *Reeve.*
nobilis, *Desh.*
Orbignyi, *Dkr.*
Patagonica, *Phil.*
penicillata, *Reeve.*
plana, *Reeve.*
Poliana, *Phil.*

polita, *Desh.*
ponderosa, *Gray.*
prostrata, *Linn.*
pubescens, *Phil.*
radiata, *Reeve.*
reticulata, *Recluz.*
rubicunda, *Phil.*
scabra, *Phil.*
scabriuscula, *Phil.*
scalaris, *Mke.*
sculpta, *Hanley.*
semiobliterata, *Desh.*
sericea, *Reeve.*
Sieboldii, *Reeve.*
simplex, *Hanley.*
solidula, *Sow.*
striatissima, *Sow.*
subrosea, *Gray.*
subtrigona, *Sow.*
tenuilamellata, *Sow.*
torrida, *Reeve.*
Traillii, *A. Adams.*
tumida, *Gray.*
turgida, *Reeve.*
variegata, *Chem.*

Genus CYCLINA, Deshayes.

Animal like that of *Dosinia*.

Shell circular, thin, inflated, inequilateral, transversely striated, and with no lunular area; beaks small, approximated; margins simple, or sometimes crenulated. Hinge wide, flat, tri-dentate in one valve and bi-dentate in the other; ligament external, somewhat covered by the margin of the rima. Muscular impression posterior, remote from the cardinal margin; sinus of pallial impression triangular, oblique, often ascending.

Ex. C. Chinensis, *Chemnitz*, pl. 108, fig. 6, 6, *a*.

In *Cyclina* the orifice of the branchial siphon is fringed, and that of the anal is simple. The shell is thin, and more or less orbicular, with the inner margins of the valves crenulated; the pallial sinus is wide, deep, central, and obtuse; the hinge is composed of two diverging primary teeth (one of which is bifid) in the right valve, and three (the central one bifid) in the left; the ligament is external and prominent; and there is no distinct lunule. The few species described are from China and India.

Species of Cyclina.

Chinensis, *Chem.*
flavida, *Desh.*
orientalis, *Sow.*

Genus CLEMENTIA, Gray.

Mantle-margins simple; siphons long, cylindrical, united; foot quadrate.

Shell transversely ovate, sub-trigonal, equivalve, inequilateral, white, thin. Hinge with a single, anterior, erect tooth, and two oblique, laminated, posterior teeth in the left valve; and two anterior, erect teeth, and a posterior, bifid, laminated tooth in the right valve. Muscular impressions two, wide apart, sub-circular; pallial impression widely and deeply sinuated posteriorly; sinus sub-triangular, ascending perpendicularly nearly as far as the beaks.

Ex. C. papyracea, *Gray*, pl. 109, fig. 1, 1, *a*.

In this genus the foot of the animal is large and crescentic, as in *Dosinia*, and the siphons are elongated and united. The shell is transversely oblong, very thin, and closed; the surface of the valves is concentrically plicate; the hinge is composed of compressed teeth, with a cavity in the margin before and behind them; and the ligament of the hinge is semi-internal. There are six species of *Clementia* known, from Australia and the Philippines.

Species of Clementia.

Essingtoniensis, *Desh.*
gracillima, *Cpr.*
granulifera, *Sow.*
papyracea, *Gray.*
similis, *Sow.*
vitrea, *Chem.*

Sub-fam. TAPESINÆ.

Siphons free at their extremities. Foot lanceolate, byssiferous.

Shell oblong, transverse. Hinge with the cardinal teeth compressed; lateral teeth single, or none.

Genus TAPES, Megerle von Mühlfeldt.

Siphons united as far as the middle, diverging at their ends; branchial siphon crowned with arborescent tentacles; anal siphon ending in simple, cylindrical tentacles; mantle-margin simple.

Shell transversely ovate, inequilateral, closed; margins entire. Hinge tri-dentate, teeth sometimes diverging, sometimes approximate, sub-parallel, often bifid or canaliculate at the apex. Pallial impression deeply sinuated posteriorly; sinus semi-oval, somewhat horizontal.

Syn. Paphia, *Bolt.*, not *Lam.*

Ex. T. pullastra, *Montagu*, pl. 109, fig. 2. Shell, T. literata, *Rumphius*, fig. 2, *a*, 2, *b*.

The animal of *Tapes* is laterally compressed and transversely ovate; the margins of the mantle-lobes are simple and entire, and the siphons have both their orifices bordered by cirrhi, which in the branchial are ciliated; the labial palps are triangular and sub-equilateral; the gills are wide, sub-quadrate, unequal, and posteriorly united; and the foot is large, compressed, linguiform, and furnished at the base with a byssal groove. The hinder end of the shell is always the longest, the surface of the valves is smooth or transversely striated, the inner margins are

smooth, and the beaks are not prominent. The hinge is composed of three slightly-diverging primary teeth (two of which are usually bifid) in each valve, and a ridge bounding the groove for the ligament, which is external; the pallial sinus is deep, oblong, and rounded at the extremity. Norway, Britain, the Black Sea, Senegal, Brazil, India, China, and New Zealand are the countries given as localities for the species of this genus, which ranges from low-water to one hundred fathoms. They bury in the sand, or conceal themselves in fissures of the rocks and among the roots of sea-weed.

Species of Tapes.

acuminata, *Sow.*
adspersa, *Chem.*
alba, *Desh.*
aranea, *Phil.*
aurea, *Gmel.*
Belcheri, *Sow.*
biradiata, *Desh.*
castrensis, *Desh.*
crassisulca, *Desh.*
Deshayesii, *Hanley.*
dura, *Gmel.*
florida, *Lam.*
floridella, *Desh.*
fluctuosa, *Gould.*
grata, *Desh.*
incerta, *Sow.*
literata, *Rumph.*
Luzonica, *Sow.*
obscurata, *Desh.*
perplexa, *Sow.*
petalina, *Lam.*
phaseolina, *Desh.*
polita, *Sow.*
quadriradiata, *Desh.*
Radatzi, *Dkr.*
radiata, *Chem.*
retifera, *Lam.*
rotundata, *Linn.*
similis, *Desh.*
squamosa, *Cpr.*
sulcaria, *Lam.*
tenuistriata, *Sow.*
textrix, *Chem.*
texturata, *Lam.*
turgida, *Lam.*
turgidula, *Desh.*
undulata, *Born.*
virginea, *Linn.*

Sub-gen. PULLASTRA, Sowerby.

Shell with the surface of the valves transversely sulcated or striated. Sinus of pallial impression obliquely ascending.

amabilis, *Phil.*
declivis, *Sow.*
englypta, *Phil.*
exarata, *Phil.*
Hanleyi, *Sow.*
inflata, *Desh.*
lirata, *Phil.*
Malabarica, *Chem.*
meroëformis, *Sow.*
rhombifera, *Lam.*
semirugata, *Phil.*
sinuosa, *Lam.*
sulcosa, *Phil.*

Sub-gen. CUNEUS, Da Costa.

Shell with the surface of the valves decussated or longitudinally striated.

analis, *Phil.*
Bruguieri, *Hanley.*
cinerea, *Desh.*
decussata, *Linn.*
denticulata, *Sow.*
fabagella, *Desh.*
galactites, *Lam.*
geographica, *Chem.*
glandina, *Desh.*
Indica, *Sow.*
intermedia, *Quoy and Gaim.*
intuspunctata, *Anton.*
Japonica, *Desh.*
Philippinarum, *Adams and Reeve.*
pullastra, *Mont.*
punicea, *Desh.*
variegata, *Sow.*
violascens, *Desh.*

Sub-gen. METIS, H. and A. Adams.

Shell with the surface of the valves corrugated.

corrugata, *Desh.*
Cumingii, *Sow.*
dactyloides, *Sow.*
disrupta, *Sow.*
obsoleta, *Chem.*

Genus SAXIDOMUS, Conrad.

Shell transversely ovate, sub-equilateral, ventricose, solid, cretaceous, or dirty grey; beaks rather tumid; lunule and area none. Hinge thick, narrow, 3–4 dentate in each valve; teeth unequal, narrow, the two anterior the most prominent, the second bifid; ligament external, very thick, elongated, semi-cylindrical. Muscular impressions large, ovately rotund, nearly equal; sinus of pallial impression large, elongated, horizontal.

Ex. S. Nuttalii, *Conrad*, pl. 109, fig. 3, 3, *a*.

In this genus there is no lunule. Eight species have been described, from Western America, India, and Australia.

Species of Saxidomus.

decussatus, *Desh.*
giganteus, *Desh.*
maximus, *Anton.*
Nuttallii, *Conr.*
opacus, *Sow.*
Petiti, *Desh.*
purpuratus, *Sow.*
squalidus, *Desh.*

Genus RUPELLARIA, Fleuriau de Bellevue.

Siphons long, unequal, united as far as their middle; the respiratory siphon fringed at the orifice with a double series of cirrhi, the longer ones pectinated; the anal siphon with numerous short, cylindrical cirrhi. Foot small, conical, linguiform, and byssiferous.

Shell transversely ovate or sub-globose, inequilateral, generally gaping posteriorly. Hinge narrow, tri-dentate in one valve, in the other bi-dentate; teeth small, approximate,

slightly diverging; ligament external. Muscular impressions large, ovato-semilunar; pallial impression posteriorly sinuated; sinus wide, rather deep, sub-trigonal, horizontal.

Syn. Irus, *Oken.* Venerupis, *Lamarck.*

Ex. R. Irus, *Linnæus*, pl. 109, fig. 4. Shell, R. Irus, fig. 4, *a*, 4, *b*.

The foot in this genus is smaller than in *Tapes*, and the siphons are united as far as their ends, which distinguishes the animal from that of *Petricola*. The species are most numerous in Northern and temperate climates, being found in Europe, the British Islands, Behring's Straits, Kamtschatka, the Crimea, Tasmania, and the Canary Islands; they inhabit the holes and crevices of rocks, in which they are usually fixed by the byssus.

Species of Rupellaria.

brevis, *Quoy and Gaim.*
carditoides, *Lam.*
Cordieri, *Desh.*
corrugata, *Desh.*
crenata, *Lam.*
Diemenensis, *Quoy and Gaim.*
distans, *Lam.*
elliptica, *Sow.*
exotica, *Lam.*
foliacea, *Desh.*
interjecta, *Desh.*
Irus, *Linn.*
oblonga, *Sow.*
macrophylla, *Desh.*
monstrosa, *Chem.*
solida, *Sow.*
subdecussata, *Desh.*
tenuistriata, *Jonas.*
texta, *Desh.*

Genus TRAPEZIUM, Megerle von Mühlfeldt.

Shell equivalve, inequilateral, obliquely or transversely elongated, the posterior side very short. Hinge with three cardinal teeth, placed beneath the beaks, in each valve, with a simple, rather elongated, lateral tooth extending along

the anterior side; ligament external. Pallial impression indistinct.

Syn. Libitina, *Schum.* Cypricardia, *Lam.*

Ex. T. rostratum, *Lamarck*, pl. 109, fig. 5. Shell, T. angulatum, *Lamarck*, fig. 5, *a*, 5, *b*.

The Australian region seems to be the chief locality for the *Trapezia*, six species having been found in that part of the globe, while but two are from Asia, and none in Europe, Africa, or America.

Species of Trapezium.

angulatum, *Lam.*
Californicum, *Conr.*
Guinaicum, *Chem.*
incarnatum, *Reeve.*
liratum, *Reeve.*
obesum, *Reeve.*
oblongum, *Linn.*
roseum, *Gould.*
rostratum, *Lam.*
solenoides, *Reeve.*
vellicatum, *Reeve.*

Genus CORALLIOPHAGA, Blainville.

Shell transversely oblong or sub-cylindrical, thin, slightly gaping posteriorly; valves white, with rather distant, elevated lamellæ. Hinge with two primary teeth in each valve, and a lamellar posterior lateral tooth. Pallial line with a wide, shallow sinus.

Syn. Lithophagella, *Gray.*

Ex. C. coralliophaga, *Gmelin*, pl. 109, fig. 6, 6, *a*.

The species of this genus are found living in coral, or imbedded in other shells.

Species of Coralliophaga.

coralliophaga, *Gmel.*
decussata, *Reeve.*
laminata, *Reeve.*
lithophagella, *Lam.*
serrata, *Reeve.*

Fam. PETRICOLIDÆ.

Labial palps small, triangular. Mantle closed below and behind, the edge thickened and reflexed over the margins of the valves, pedal aperture short, anterior; siphons elongated, unequal, separated as far as the base; the branchial the larger, cylindrical, the orifice fringed with arborescent filaments; the anal conical, with a membranous valve, and furnished at the margin with a single series of simple cirrhi; gills unequal, ovately quadrangular, obliquely plicated. Foot small, compressed, elongately conical, furnished with a byssal groove.

Shell free or boring, gaping, often irregular; valves usually white, or covered with a thin, hard epidermis. Hinge narrow, bi-dentate in each valve. Pallial line deeply sinuated.

Genus PETRICOLA, Lamarck.

Shell ovate, white, covered with a hard, thin epidermis, ventricose, anterior side short, posterior gaping. Hinge composed of two primary teeth in each valve, one of which is often obsolete or rudimentary; lateral teeth none; ligament short, external. Pallial line with a deep, rounded sinus.

Ex. P. hyalina, *Deshayes*, pl. 110, fig. 1. Shell, P. lithophaga, *Retzius*, fig. 1, *a*, 1, *b*.

The siphons of the animal in *Petricola* are elongated and distinct from each other, with their orifices ciliated; the mantle-lobes are united with the exception of a small anterior opening, and the foot is compressed and lanceolate,

with a byssiferous fissure a little behind the middle of the lower edge. The cardinal or primary teeth of the hinge are bent up as if arising from the inner surface of the valves under the beaks. The species of *Petricola* appear to be most numerous in Western America; they are also found in the Pacific, the Mediterranean and Red Seas, India, and New Zealand. They form excavations in limestone rocks and coral, and also bury in mud.

Species of Petricola.

amygdalina, *Sow.*
bipartita, *Desh.*
Californica, *Conr.*
Chinensis, *Desh.*
cognata, *C. B. Adams.*
concinna, *Sow.*
cultellus, *Desh.*
cylindracea, *Desh.*
dactylus, *Sow.*
denticulata, *Sow.*
discors, *Sow.*
fornicata, *Say.*
gibba, *Midd.*
gracilis, *Desh.*
hyalina, *Desh.*
linguatula, *Desh.*
lithophaga, *Retz.*
mirabilis, *Desh.*
nivea, *Chem.*
pholadiformis, *Lam.*
rariflamma, *Desh.*
robusta, *Sow.*
rugosa, *Sow.*
semilamellata, *Lam.*
serrata, *Desh.*
subglobosa, *Sow.*
tenuis, *Sow.*
ventricosa, *Desh.*

Genus CHORISTODON, Jonas.

Shell ovate, rugose, tubercular, ribbed behind, tumid; beaks anterior. Hinge composed of two primary teeth in each valve, the upper in the right valve compressed and elongated, and in the left valve triangular, oblique, and bifid; lateral teeth none; ligament short, external, in a sunken groove. Anterior adductor scar oblong, hinder very large, rounded; pallial line with a deep, round sinus.

Syn. Naranio, *Gray*.

Ex. C. divaricatum, *Chemnitz*, pl. 110, fig. 2, 2, *a*.

The shells of this genus have very much the external appearance and hinge of *Coralliophaga*, but are easily known by the large sinus in the pallial line. They are generally covered with a calcareous coating, which hides the rugosities of the surface; they live in stony corals.

Species of Choristodon.

divaricatum, *Chem.*
lapicidum, *Chem.*
radiatum, *Gray*.

Fam. GLAUCONOMYIDÆ.

Labial palps very large, broadly falciform. Mantle-margins plain, united, pedal opening anterior, rather large; siphons very long, compressed, united nearly to their ends, orifices fringed; gills two on each side, long, rounded in front, united behind, the outer pair shorter, and furnished with a plaited, dorsal flap. Foot moderately large, thick, compressed, linguiform, keeled.

Shell oblong, thin, ventricose, closed, covered with a green epidermis. Hinge narrow, with three teeth in each valve, one of them bifid; ligament external, oblong, anterior. Muscular impressions oblong and marginal, the hinder sub-quadrate; pallial line with a deep, narrow, angular sinus.

Genus GLAUCONOMYA, Bronn.

Shell oblong, covered with a hard, green epidermis extending beyond the edge of the valves. Hinge narrow,

composed of three teeth in each valve, the middle tooth in the left, and the hinder one in the right valve bifid; lateral teeth none; ligament external, marginal. Pallial sinus very deep and narrow, ascending obliquely towards the back of the shell.

Syn. Glauconome, *Gray*, not *Goldfuss*.

Ex. G. rugosa, *Reeve*, pl. 110, fig. 3. Shell, G. rugosa, fig. 3, *a*, 3, *b*.

The species of the genus *Glauconomya* are almost exclusively confined to the Philippine Archipelago, where they live in the sandy mud at the mouths of rivers, and even in the estuaries where the water is partially fresh. They bury themselves in the soil, and appear to be very similar in their habits to some of the Solens. One species inhabits the river Ganges, and another the rivers of China. The family differs from that of *Solenidæ* in the number and disposition of the hinge-teeth; and from *Veneridæ* in the form of the teeth, the union of the mantle-lobes, in their fresh-water habitation, and in the shells being covered with a hard, green epidermis.

Species of Glauconomya.

angulata, *Reeve*.
cerea, *Reeve*.
Chinensis, *Gray*.
corrugata, *Reeve*.
curta, *Hanley*.
psammotella, *Desh*.
radiata, *Reeve*.
rostralis, *Desh*.
rugosa, *Reeve*.
straminea, *Reeve*.
virens, *Linn*.

Fam. CYPRINIDÆ.

Palpi narrow, elongate. Mantle open in front and beneath, simple, united behind by a curtain; siphons very

short, the branchial wide, compressed, the orifice ciliated; the anal narrower, conical, with the apex crowned with short cilia; gills large, quadrangular, unequal, united posteriorly. Foot thick and linguiform.

Shell regular, equivalve, sub-cordiform, covered with a thick, dark, shining epidermis. Hinge with three, unequal, divaricate teeth in each valve, and a lateral tooth, remote from the hinge, on the hinder side; ligament external, conspicuous.

Genus CYPRINA, Lamarck.

Shell more or less orbicular, solid, equivalve, closed, covered with a horny epidermis; beaks prominent, incurved; lunule none; margins smooth. Hinge with three primary teeth, and one lateral tooth in each valve. Pallial impression simple, or with a very slight siphonal inflection.

Syn. Cardia, *Olafsen*, not *Hill.* Cyclas, *Link*, not *Klein* or *Brug.* Arctica, *Schum.* Asmidia, *Gistel.*

Ex. C. Islandica, *Linnæus*, pl. 110, fig. 4. Shell, C. Islandica, fig. 4, *a*, 4, *b*.

The hinge teeth are 3—3, triangular; the front one of the left valve is conical and rugose, like the anterior lateral tooth of *Venus*, and the hinder one is very thin and compressed; the middle one of the right valve is compressed, and the hinder one is very broad, with a deep groove. As Dr. Gray has observed, the shells of this genus have very much the appearance of those of *Astarte*, but the teeth and form are more like those of the *Veneridæ*. The only species known is from the seas of Europe.

Fam. CYRENIDÆ.

Labial palps lanceolate. Mantle open in front, the margins simple; siphons short, plain-edged, produced, either partially separated, or completely united to their extremities; gills two on each side, large, unequal, united behind. Foot large and tongue-shaped.

Shell more or less tumid, sub-orbicular, closed, covered with a hard, olive, brittle, often polished epidermis; beaks frequently eroded; surface of valves concentrically striated or furrowed. Hinge composed of three, or sometimes two diverging cardinal teeth; lateral teeth compressed; ligament external. Pallial line simple, or with a slight siphonal inflection.

Fresh-water; fluviatile, or estuary.

Genus CYRENA, Lamarck.

Mantle-lobes united in their posterior third; siphons separate as far as their bases.

Shell solid, sub-cordate, ventricose, inequilateral, covered with a horny epidermis; beaks eroded or decorticated. Hinge with three teeth in each valve, the anterior of right, and hinder of left valve smallest; lateral teeth smooth, the front roundish, the hinder rather compressed; ligament external.

Syn. Cyanocyclas, *Férus.* Polymesoda, *Rafin.* Cyrenocyclas, *Agass.* Geloina, *Gray.* Pseudocyrena, *Bourguignat.*

Ex. C. Ceylanica, *Chemnitz*, pl. 110, fig. 5, 5, *a.*

The species of *Cyrena* inhabit the brackish waters of torrid regions, numerous examples of the genus occurring

in Tropical America, Australia, India, Africa, China, and the Islands of the Pacific. They are found usually near the coast, often buried in the mud of mangrove-swamps.

Species of Cyrena.

æquilateralis, *Desh.*
affinis, *Desh.*
angulata, *Desh.*
anomala, *Desh.*
arctata, *Desh.*
Bengalensis, *Desh.*
Buschii, *Phil.*
Caroliniana, *Bosc.*
Ceylanica, *Chem.*
Charpentieriana, *Bourg.*
compta, *Desh.*
conjuncta, *Desh.*
cordiformis, *Recluz.*
Cumingii, *Desh.*
cyclostoma, *Bourg.*
cyprinoides, *Quoy and Gaim.*
decipiens, *Desh.*
Deshayesiana, *Bourg.*
divaricata, *Desh.*
dura, *Desh.*
Essingtonensis, *Desh.*
expansa, *Mouss.*
fallax, *Desh.*
Floridana, *Conr.*
Fontainei, *D'Orb.*
Galatheæ, *Mörch.*
Gauritziana, *Krauss.*
impressa, *Desh.*
incerta, *Desh.*
inflata, *Desh.*
inquinata, *Desh.*
insignis, *Desh.*
isocardioides, *Desh.*
Jukesii, *Desh.*
lauta, *Desh.*
mactroides, *Desh.*
maritima, *C. B. Adams.*
Moquiniana, *Bourg.*
nitida, *Desh.*
nitidula, *Desh.*
notabilis, *Desh.*
oblonga, *Quoy and Gaim.*
oviformis, *Desh.*
pallida, *Desh.*
Papua, *Less.*
Peruviana, *Desh.*
Petitiana, *Bourg.*
placens, *Hanley.*
placida, *Desh.*
radiata, *Hanley.*
Raymondi, *Bourg.*
salmacida, *Morel.*
similis, *Desh.*
sinuosa, *Desh.*
solida, *Phil.*
sordida, *Hanley.*
sublobata, *Desh.*
suborbicularis, *Phil.*
subquadrata, *Desh.*
Sumatrensis, *Sow.*
triangula, *Phil.*
triangularis, *Metcalfe.*
turgida, *Lea.*
Vanikorensis, *Quoy and Gaim.*
ventricosa, *Desh.*

Genus CORBICULA, Megerle von Mühlfeldt.

Shell orbicular, sub-cordate, solid, closed; valves concentrically furrowed, covered with a thick, polished epidermis. Hinge furnished with three primary teeth in each valve, the front of right, and the hinder of left valve smallest; lateral teeth elongate, compressed, striated across; ligament thick and prominent. Pallial line slightly sinuated.

Ex. C. fluminea, *Müller*, pl. 110, fig. 6, 6, *a*.

The shells of this genus are orbicular, and covered with a polished epidermis. Like the species of *Cyrena*, they are found in the mud of rivers and estuaries in various parts of the world; America, China, and India harbouring examples. Very numerous extinct forms occur in the Wealden of Europe and the United States.

Species of Corbicula.

Africana, *Krauss.*
ambigua, *Desh.*
australis, *Desh.*
Bengalensis, *Desh.*
Bensoni, *Desh.*
Brasiliana, *Desh.*
Cashmiriensis, *Desh.*
compressa, *Mouss.*
consobrina, *Caillaud.*
convexa, *Desh.*
cor, *Lam.*
Cumingii, *Desh.*
cuneata, *Jonas.*
fluminalis, *Müll.*
fluminea, *Müll.*
fluviatilis, *Müll.*
grandis, *Desh.*
incrassata, *Desh.*
Largillierti, *Phil.*
limosa, *Maton.*
Malaccensis, *Desh.*
Moussoni, *Desh.*
Nepeanensis, *Lesson.*
nitens, *Phil.*
obscura, *Desh.*
obsoleta, *Desh.*
occidens, *Bens.*
orientalis, *Lam.*
ovalina, *Desh.*
Panormitana, *Bivon.*

Paranensis, *D'Orb.*
pulchella, *Mouss.*
pullata, *Phil.*
pusilla, *Phil.*
radiata, *Phil.*
recurvata, *Eydoux.*
rivalis, *V. d. Busch.*
semisulcata, *Desh.*
similis, *Gray.*
squalida, *Desh.*
striatella, *Desh.*
sulcatina, *Desh.*
triangularis, *Desh.*
trigona, *Desh.*
tumida, *Desh.*
variegata, *D'Orb.*
Woodiana, *Lea.*

Genus BATISSA, Gray.

Shell sub-cordate, solid, covered with a thick, horny, greenish epidermis. Hinge with three cardinal teeth in each valve, the front in the right, and the hinder in the left valve smallest; lateral teeth compressed, striated, the anterior very short, the posterior elongate.

Ex. B. tenebrosa, *Hinds*, pl. 111, fig. 1, 1, *a*.

In this genus the shells are solid, and covered with a dark, thick epidermis; they are also frequently eroded at the beaks. The species are met with in Sumatra and Java, the Philippines, Australia, and the Islands of the Pacific.

Species of Batissa.

atrata, *Desh.*
Childrenæ, *Gray.*
corbiculoides, *Desh.*
eximia, *Dkr.*
humerosa, *Desh.*
insignis, *Desh.*
Jayensis, *Lea.*
Keraudrenia, *Less.*
lenticularis, *Desh.*
megadesma, *Desh.*
obesa, *Hinds.*
producta, *Desh.*
rotundata, *Lea.*
tenebrosa, *Hinds.*
triquetra, *Desh.*
violacea, *Lam.*

Genus VELORITA, Gray.

Shell cordate, triangular, thick, solid, covered with an epidermis. Hinge with three cardinal teeth in each valve, the front in the right, and the hinder in the left valve smallest; lateral teeth large, very finely striated, the anterior very large, angular, the hinder elongate and compressed.

Ex. V. cyprinoides, *Gray*, pl. 111, fig. 2, 2, *a*.

The shells of *Velorita* are very solid, and covered with a green, polished epidermis. One of the two species described, *V. cyprinoides*, is from the rivers of Japan.

Species of Velorita.

cyprinoides, *Gray*. recurvata, *Valenc*.

Genus SPHÆRIUM, Scopoli.

Siphons separate, diverging into two nearly equal tubes.

Shell equivalve, thin, oblong, cordate, equilateral, more or less inflated, smooth, or concentrically striated. Hinge with two moderately-diverging cardinal teeth in each valve, the front of right valve, and the hinder of left valve smallest; lateral teeth elongate, compressed, smooth, of right valve double, of left valve simple.

Syn. Nux, *Humph.* Cornea, *Mühlf.* Cyclas, *Brug.*, not *Klein* or *Link.* Amesoda, *Rafin.* Sphæriastrum, *Bourg.* Cyrenastrum, *Bourg.* Corneocyclas, *Férus.*

Ex. S. lacustre, *Müller*, pl. 111, fig. 3. Shell, S. corneum, *Linnæus*, fig. 3, *a*, 3, *b*.

This genus differs from *Musculium* in the siphons, which

are separate and diverging at their ends. The muscular and pallial impressions are indistinct; the latter is provided with a sinus. The species of *Sphærium* are all fluviatile, and inhabit, especially, the fresh-water lakes and rivers of cold and temperate regions. They are most numerous in Europe and North America.

Species of Sphærium.

acuminatum, *Prime.*
albulum, *Prime.*
argentinum, *D'Orb.*
aureum, *Prime.*
bulbosum, *Anth.*
cæruleum, *Prime.*
Capense, *Krauss.*
cardissa, *Prime.*
castaneum, *Prime.*
consobrinum, *Férus.*
constrictum, *Anth.*
corneum, *Linn.*
dentatum, *Hald.*
detruncatum, *Prime.*
distortum, *Prime.*
dubium, *Say.*
eburneum, *Anth.*
egregium, *Say.*
elegans, *C. B. Adams.*
elevatum, *Hald.*
emarginatum, *Prime.*
fabale, *Prime.*
flavum, *Prime.*
furcatum, *Rafin.*
giganteum, *Prime.*
gracile, *Prime.*
Indicum, *Desh.*
inornatum, *Prime.*
Jayense, *Prime.*
lacustre, *Müll.*
maculatum, *Morel.*
mirabile, *Prime.*
modestum, *Prime.*
nitidum, *Migh. and Adams.*
Novæ Zelandiæ, *Desh.*
orbicularium, *Barr.*
ovale, *Stimp.*
pallidum, *Gray.*
patella, *Gould.*
partumeium, *Say.*
pellucidum, *Prime.*
pisidioides, *Gray.*
ponderosum, *Prime.*
proximum, *Alder.*
rhomboideum, *Say.*
rivicola, *Leach.*
rosaceum, *Prime.*
Ryckholtii, *Normand.*
securis, *Prime.*
simile, *Say.*
simplex, *Prime.*
solidum, *Normand.*
sphærium, *Anth.*
stramineum, *Conr.*
Steenbuchii, *Möll.*
Steinii, *Schmidt.*
tenue, *Prime.*
tenuistriatum, *Prime.*

Terverianum, *Dupuy.*
transversum, *Say.*
truncatum, *Linsl.*

Genus MUSCULIUM, Link.

Siphons united as far as their extremities.

Shell equivalve, thin, usually tumid, sub-oval, inequilateral, smooth, or concentrically striated. Hinge with two moderately-diverging teeth in each valve, the front of right, and the hinder of left valve the smallest; lateral teeth elongate, smooth, compressed, of right valve double, of left valve simple; ligament external.

Syn. Pisum, *Mühlf.* Pisidium, C. *Pfeiff.* Pera, *Leach.* Galileja, *Costa.* Euglesia, Cordula, *Leach.* Eupera, *Bourg.*

Ex. M. amnicum, *Müller*, pl. 111, fig. 4. Shell, M. amnicum, fig. 4, *a*, 4, *b*.

In this genus the siphons are short, and united to their ends; the shells are usually of a green or horn colour, and inhabit streams and ponds, chiefly of temperate countries.

Species of Musculium.

abditum, *Hald.*
abruptum, *Hald.*
altile, *Prime.*
amnicum, *Müll.*
australe, *Phil.*
Bahiense, *Spix.*
Canariense, *Shuttl.*
casertanum, *Poli.*
Chilense, *D'Orb.*
cicer, *Prime.*
compressum, *Prime.*
contortum, *Prime.*
Creplinii, *Dkr.*
dubium, *Say.*
duplicatum, *Pfeiff.*
edentulum, *Say.*
ferrugineum, *Krauss.*
Henslowianum, *Shepp.*
Kurtzii, *Prime.*
lenticulare, *Normand.*
Lumstenianum, *Forbes.*
maculatum, *Anton.*
minor, *Migh. and Adams.*
modioliforme, *Anton.*
nitidum, *Jenyns.*
Noveborocense, *Prime.*

obscurum, *Prime.*
obtusale, *Pfeiff.*
parasiticum, *Parreys.*
pulchellum, *D'Orb.*
pusillum, *Gmel.*
pygmæum, *C. B. Adams.*
Recluzianum, *Bourg.*
roseum, *Scholtz.*
rotundatum, *Prime.*
rubellum, *Prime.*
semen, *Mke.*
supinum, *Schmidt.*
tenebrosum, *Da Costa.*
variabile, *Prime.*
Veatleyi, *C. B. Adams.*
ventricosum, *Prime.*
Virginicum, *Gmel.*
vitreum, *Risso.*
zonatum, *Prime.*

Fam. CYRENOIDIDÆ.

Labial palps elongate, narrow. Mantle-lobes free beneath, united in front and behind; siphons two, elongated, united, contractile (not retractile); gills two on each side, unequal, narrow, united behind. Foot sub-cylindrical, elongated, club-shaped.

Shell orbicular, ventricose, thin, covered with a hard, olivaceous epidermis; valves often eroded at the beaks. Hinge with three cardinal teeth in one valve, and two in the other, the central tooth of the right valve bifid; ligament external, elongated, prominent. Muscular impressions long and narrow; pallial line simple.

Genus CYRENOIDA, Joannis.

Shell oblong or roundish, thin, ventricose, covered with a dark olive epidermis. Hinge with the cardinal teeth, 3—2, the front and hinder of right valve thin and laminar, united above, under the beak, and inclosing the small, triangular, central tooth; the two teeth of the left valve united above, under the beak, and fitting into the narrow fissure between the central and two united teeth in the

other valve; front lateral tooth none, hinder rudimentary. Siphonal inflection none.

Syn. Cyrenella, *Desh.* Cyrenoides, *Sow.* Cyrenodonta, *Auct.*

Ex. C. Dupontia, *Joannis*, pl. 111, fig. 5. Shell, C. Dupontia, fig. 5, *a*, 5, *b*.

The typical species of *Cyrenoida* is from the rivers of Senegal. The mantle is simple-edged, and is open in front and below; the siphons are united and short; the gills are unequal, narrow, and united behind; and the foot is cylindrical and elongated.

Species of Cyrenoida.

Dupontia, *Joannis.* Senegalensis, *Desh.*
lenticularis, *Desh.*

Fam. CARDIIDÆ.

Palpi slender, acuminate. Mantle freely open in front; siphons distinct, but very short, and nearly sessile, their bases and sides furnished with tentacular filaments; gills two on each side, thick, united together behind the body. Foot very long and geniculate.

Shell regular, equivalve, more or less cordiform, usually inflated, closed or gaping posteriorly; epidermis thin, rarely distinct; surface of valves usually radiately ribbed or furrowed, rarely smooth; margins crenulated. Hinge composed of two oblique primary teeth in each valve, and two elongate, lamellar laterals; ligament external, short, conspicuous. Muscular impressions sub-quadrate; pallial line simple, or slightly sinuated behind.

Genus CARDIUM, Linnæus.

Shell globose, thick or thin, gibbose, nearly equilateral, more or less gaping posteriorly, the margins often serrated; valves sometimes with elevated, keeled, membranaceous, radiating ribs.

Ex. C. edule, *Linnæus*, pl. 111, fig. 6. Shell, C. costatum, *Linnæus*, fig. 6, *a*, 6, *b*.

The dentition of the hinge in this genus is composed of two primary teeth in each valve, placed so as to form a cross when the valves are closed. The shell is more or less heart-shaped, the radiating ribs which proceed from the prominent beaks are usually scaly or spiny, and the hind slope is sculptured differently from the rest of the surface. The species are generally distributed.

Species of Cardium.

costatum, *Linn.*
hians, *Brocchi.*

Sub-gen. PECTUNCULUS, Adanson (Bucardium *Gray*).

Shell globose, solid, costated; hinder gape narrow, and strongly toothed on the hinder edge.

Belcheri, *Brod. and Sow.*
coronatum, *Spengl.*
incarnatum, *Reeve.*
Indicum, *Lam.*
lima, *Spengl.*
pseudofossile, *Reeve.*
ringens, *Chem.*
Sinense, *Sow.*
vertebratum, *Jonas.*

Sub-gen. TRACHYCARDIUM, Mörch (Pectunculus, *Mart.*, not *Adanson*).

Shell oblong, oblique, sub-globose; valves with radiating, squamose ribs; hinder gape narrow, and toothed on the hinder edge.

alternatum, *Sow.*
angulatum, *Lam.*
arenicolum, *Reeve.*
assimile, *Reeve.*
Dupuchense, *Reeve.*
enode, *Sow.*
flavum, *Linn.*
foveolatum, *Sow.*
impolitum, *Sow.*
lacunosum, *Reeve.*
leucostomum, *Bow.*
maculatum, *Sow.*
maculosum, *Wood.*
muricatum, *Linn.*
nebulosum, *Reeve.*
oxygonum, *Sow.*
Panamense, *Sow.*
procerum, *Sow.*
pulicarium, *Reeve.*
rubicundum, *Reeve.*
subelongatum, *Sow.*
subrugosum, *Sow.*
unicolor, *Sow.*
variegatum, *Sow.*
vimineum, *Martyn.*

Sub-gen. ISOCARDIA, Klein (Acanthocardia, *Gray*).

Shell sub-globose, tumid; valves with strong, spiny, radiating ribs; hinder gape nearly closed.

aculeatum, *Linn.*
consors, *Brod. and Sow.*
Deshayesii, *Payr.*
echinatum, *Linn.*
erinaceum, *Lam.*
isocardia, *Linn.*
Mindanense, *Reeve.*
multispinosum, *Sow.*
orbita, *Brod. and Sow.*
paucicostatum, *Sow.*
pseudolima, *Lam.*
rastrum, *Reeve.*
rusticum, *Linn.*
tuberculatum, *Linn.*

Sub-gen. CERASTODERMA, Poli (Cerastes, *Poli*, not *Hasselquist*).

Shell sub-cordate, convex behind; lunule simple; valves closed, smooth or nearly smooth behind. Hinge with the cardinal teeth well developed.

Balticum, *Beck.*
Californianum, *Conr.*

Californiense, *Desh.*
ciliatum, *Fabr.*
edule, *Linn.*
Eichwaldi, *Reeve.*
elegantulum, *Beck.*
exiguum, *Linn.*
Lamarckii, *Reeve.*
magnum, *Born.*
Nuttallii, *Conr.*
ovale, *Sow.*
setosum, *Redf.*
substriatum, *Conr.*
Suecicum, *Reeve.*

Sub-gen. SERRIPES, Beck (Aphrodita, *Lea.* Acardo, *Swains.*).

Shell sub-cordate, compressed, rather thin, sub-equilateral; valves with obsolete, radiating ridges, slightly gaping; beaks rather prominent. Hinge with the cardinal teeth wanting.

blandum, *Gould.*
Grœnlandicum, *Chem.*
Islandicum, *Chem.*
modestum, *Adams and Reeve.*
muticum, *Reeve.*

Genus PAPYRIDEA, Swainson.

Shell thin, smooth, oblong, elongate or transversely oval; hinder gape moderate, and furnished with a serrated posterior margin.

Ex. P. spinosa, *Meuschen*, pl. 112, fig. 1, 1, *a.*

There are but few species of *Papyridea* at present known, which are from Madagascar and Australia.

Species of Papyridea.

aspera, *Sow.*
hiulca, *Reeve.*
ringicula, *Sow.*
spinosa, *Meusch.*
transversa, *Sow.*

Sub-gen. FULVIA, Gray.

Shell sub-globose, rather produced behind.

Cumingii, *Brod.*
bullata, *Linn.*
papyracea, *Chem.*
tenuicostata, *Sow.*

Genus LÆVICARDIUM, Swainson.

Shell longitudinally oval, inequilateral; surface of valves simple, neither ribbed nor spinous; hinder gape small.

Syn. Liocardium, *Mörch.*

Ex. L. Norvegicum, *Spengler*, pl. 112, fig. 2. Shell, L. Norvegicum, fig. 2, *a*, 2, *b*.

The shells of this group are readily to be distinguished by the smooth surface of the valves. The species are widely distributed, being found in Europe, Africa, the West Indies, America, California, and China.

Species of Lævicardium.

alternatum, *Sow.*
aurantiacum, *Adams & Reeve.*
australe, *Sow.*
Beechei, *Adams and Reeve.*
biradiatum, *Brug.*
Brasilianum, *Lam.*
citrinum, *Chem.*
elatum, *Sow.*
Elenense, *Sow.*
Europæum, *Wood.*
fragile, *Sow.*
Kalamantinum, *Adams and Reeve.*
lævigatum, *Linn.*
lyratum, *Sow.*
multipunctatum, *Sow.*
Norvegicum, *Spengl.*
oblongum, *Chem.*
oviputamen, *Reeve.*
pectinatum, *Linn.*
Pennantii, *Beck.*
pulchrum, *Reeve.*
Siculum, *Sow.*
striatulum, *Sow.*
vitellinum, *Reeve.*

Genus HEMICARDIA, Klein.

Shell cordate, keeled, very short, hinder side shorter or impressed; lunule simple; valves closed, and smooth or nearly smooth behind. Hinge with the cardinal teeth distinct, more or less distorted.

Syn. Cor, *Meusch.* Corculum, *Hebenstr.* Cardissa, *Mühlf.* Isocardia, *Oken,* not *Lam.* or *Klein.* Hemicardium, *Cuv.*

Ex. H. cardissa, *Linnæus,* pl. 112, fig. 3, 3, *a.*

The members of this group are pretty numerous, and are met with on the shores of most temperate and tropical countries. The shells of the typical examples are very peculiar, from their compressed, heart-shaped form.

Species of Hemicardia.

cardissa, *Linn.*	lineata, *Gmel.*
Dionæa, *Brod. and Sow.*	monstrosa, *Chem.*
humana, *Chem.*	unimaculata, *Sow.*

Sub-gen. FRAGUM, Bolten (Hemicardium, *Swains.*, not *Cuv.*)

Shell half-heart-shaped, the anterior side abruptly truncate and very short, the hinder side often longer than the anterior; beaks carinated; ribs smooth, or nodulose.

biangulata, *Brod. and Sow.*	imbricata, *Born.*
carditæformis, *Reeve.*	læva, *Swains.*
donaciformis, *Spengl.*	media, *Linn.*
fasciata, *Mont.*	munda, *Reeve.*
fragum, *Linn.*	nivalis, *Reeve.*
hemicardium, *Linn.*	nodosa, *Mont.*

obovalis, *Brod. and Sow.*
ovuloides, *Reeve.*
planicostata, *Sow.*
speciosa, *Adams and Reeve.*
tumorifera, *Lam.*
unedo, *Linn.*

Sub-gen. CTENOCARDIA, H. and A. Adams.

Shell half-heart-shaped, the anterior side abruptly truncate; beaks carinated; ribs spinose.

Adamsii, *Reeve.*
exasperata, *Sow.*
fornicata, *Sow.*
hystrix, *Brod.*
imbricata, *Sow.*
virgo, *Reeve.*

Sub-gen. LUNULICARDIA, Gray.

Shell closed, smooth or nearly smooth behind, cordate, keeled; lunule deeply impressed.

auricula, *Forsk.*
concamerata, *Wood.*
retusa, *Linn.*
subretusa, *Sow.*

Genus ADACNA, Eichwald.

Siphons elongated, united nearly to their ends, the orifices simple. Foot compressed.

Shell thin, compressed, radiately grooved, gaping behind. Hinge nearly edentulous. Pallial line sinuated.

Syn. Pholadomya, *Agass. and Midd.*, not *Sow.* Hypanis, *Pander.*

Ex. A. læviuscula, *Eichwald*, pl. 112, fig. 4. Shell, A. læviuscula, fig. 4, *a*, 4, *b*.

The species of this group are found in the Aral, Caspian, Azof, and Black Seas, and in the embouchures of the Volga, Dneister, Dneiper, and Don, burrowing in mud.

Species of Adacna.

colorata, *Eichw.*
edentula, *Pallas.*
læviuscula, *Eichw.*
plicata, *Eichw.*
vitrea, *Eichw.*

Sub-gen. MONODACNA, Eichwald.

Shell transversely ovate, posteriorly gaping, radiately ribbed, smooth. Hinge with a single tooth.

Caspia, *Eichw.*
pseudocardia, *Desh.*

Sub-gen. DIDACNA, Eichwald.

Shell transverse, ribbed; beaks produced and posteriorly carinated. Hinge with two primary teeth.

Australiensis, *Reeve.*
crassa, *Eichw.*
donaciformis, *Schræt.*
trigonoides, *Pallas.*

Fam. BUCARDIIDÆ.

Labial palps long and narrow. Mantle closed, double-edged, with a pedal opening in front; siphonal orifices close together, sessile, with fringed margins; gills very large, nearly equal. Foot compressed, triangular, acuminate.

Shell cordiform, ventricose; beaks sub-spiral, wide apart. Hinge with two primary and two lateral teeth in each valve, the anterior lateral teeth sometimes obsolete. Muscular impressions small; pallial line simple.

Animal marine; burrowing in sand.

Genus BUCARDIA, Lister.

Shell heart-shaped, ventricose, equivalve, smooth or furrowed; beaks prominent, contorted; margin of valves entire. Hinge composed of two erect primary teeth (one of them indented) parallel with the margin in one valve, and three in the other; a lateral tooth and tooth-like socket; ligament external, furcate anteriorly. Muscular impressions small; pallial sinus none.

Syn. Glossus, Glossoderma, *Poli.* Buccardium, *Mühlf.* Isocardia, *Lam.*, not *Klein.*

Ex. B. cor, *Linnæus*, Pl. 112, fig. 5. Shell, B. cor, fig. 5, *a*, 5, *b*.

Of this genus, the example given, *B. cor*, is an inhabitant of the seas of Europe. The other species, forming the subgenus *Meiocardia*, are entirely from China and the Philippines.

Species of Bucardia.

cor, *Linn.*

Sub-gen. MEIOCARDIA, H. and A. Adams.

Shell with the surface of the valves concentrically grooved, not covered with an epidermis.

Lamarckii, *Sow.*
Moltkiana, *Chem.*
tetragona, *Adams and Reeve.*
vulgaris, *Reeve.*

Genus CARDILIA, Deshayes.

Shell oval-oblong, longitudinal, white, cordiform, ventricose; beaks large, prominent. Hinge with a small cardinal tooth, and at its side a fossette; a spoon-shaped cavity to

receive the internal ligament. Anterior muscular impression rounded, superficial; posterior on a thin, horizontal lamina, projecting into the interior.

Syn. Hemicyclonosta, *Desh.*

Ex. C. semisulcata, *Lamarck*, pl. 112, fig. 6, 6, *a*.

There are only three species of this genus as yet described, which are inhabitants of the China Sea and the Philippines.

Species of Cardilia.

inermis, *Desh.*
Martini, *Desh.*
semisulcata, *Lam.*

Fam. CHAMIDÆ.

Labial palps small, curled, obliquely truncate. Mantle closed, the margins united by a curtain fringed with tentacular filaments; siphonal orifices small, wide apart, the branchial slightly prominent, with the orifice fimbriated, the anal with a simple valve; gills two on each side, unequal, plicate, the outer pair very short and narrow, united to each other behind and to the mantle. Foot cylindrical, bent.

Shell inequivalve, irregular, adherent; beaks unequal, recurved or sub-spiral. Hinge furnished with two teeth in one valve, and a single large tooth in the other; ligament external. Muscular impressions large, reticulated; pallial line simple.

Living attached to stones and rocks.

Genus CHAMA, Linnæus.

Shell irregular, inequivalve, adherent; beaks recurved, unequal. Hinge composed of a single thick, oblique, sub-

crenulated tooth, inserted in a fossa between the two teeth of the opposite valve; ligament external, depressed. Muscular impressions lateral, wide apart.

Syn. Globus, *Klein.* Stola, *Browne.* Jataronus, *Adans.* Macerophyllum, *Meusch.* Maceris, *Modeer.* Macerophylla, *Martini.* Psilopus, *Poli.*

Ex. C. imbricata, *Broderip*, pl. 113, fig. 1. Shell, C. macerophylla, *Chemnitz*, fig. 1, *a*, 1, *b*.

The shell of *Chama* consists of three layers; the outer or coloured layer is laminated by oblique lines of growth, with corrugations at right angles to the laminæ; the foliaceous spines contain reticulated tubuli; the middle layer is opaque white, and consists of ill-defined vertical prisms or corrugated structure; the inner layer is transparent and membranous, and penetrated by scattered, vertical tubuli. Upwards of forty species are known, from tropical seas. They are found among coral-reefs in India, China, the West Indies, the Canaries, and the Mediterranean.

Species of Chama.

æruginosa, *Lam.*
appressa, *Reeve.*
brassica, *Reeve.*
carditæformis, *Reeve.*
cistula, *Reeve.*
cornuta, *Chem.*
corrugata, *Brod.*
crenulata, *Lam.*
cristella, *Lam.*
crocata, *Lam.*
decussata, *Lam.*
exigua, *Reeve.*
fimbriata, *Reeve.*
florida, *Lam.*
fragum, *Reeve.*
frondosa, *Brod.*
gryphoides, *Linn.*
imbricata, *Brod.*
iostoma, *Lam.*
Janus, *Reeve.*
Japonica, *Lam.*
Jukesii, *Reeve.*
laciniata, *Adams and Reeve.*
Lazarus, *Linn.*
limbula, *Lam.*
lingua-felis, *Reeve.*
lobata, *Brod.*
macerophylla, *Chem.*
Pacifica, *Brod.*
Panamensis, *Reeve.*

pellis-phocæ, *Reeve.*
pellucida, *Brod.*
prætexta, *Reeve.*
producta, *Brod.*
radians, *Lam.*
rubea, *Reeve.*
ruderalis, *Lam.*
Rüppellii, *Reeve.*
sarda, *Reeve.*
sordida, *Brod.*
variegata, *Reeve.*

Sub-gen. ARCINELLA, Schumacher.

Shell spinose, nearly regular and equivalve, always attached by the right umbo; lunule distinct.

echinata, *Brod.*
spinosa, *Schum.*

Fam. CHAMETRACHÆIDÆ.

Animal free, or attached by a byssus. Mouth oval, with large, narrow lips, at the end of which are the narrow, pointed, labial palps. Mantle double-edged, the inner edge expanded; pedal opening small, anterior, under the beaks; siphonal orifices surrounded by a thickened border, the branchial plain, the anal remote, with a tubular valve; gills two on each side, narrow, plicate, united behind, the outer pair composed of a single lamina, the inner thick, with grooved margins. Foot small, thick, cylindrical, with a byssal groove.

Shell regular, equivalve, truncate anteriorly; surface of valves strongly ribbed; margins dentate. Ligament external. Muscular impressions united, the hinder large, subcentral, the anterior obsolete.

Genus CHAMETRACHÆA, Klein.

Shell regular, equivalve, transverse, triangular, inequilateral, solid, with a large byssal sinus in each valve in

front near the beak; surface of valves with prominent, scaly, radiating ribs; margins strongly dentate. Hinge composed of a single primary, compressed tooth in each valve, two posterior lateral teeth in one valve, and a single one in the other; ligament external, marginal.

Syn. Labrum, *Meusch.* Lavacrum, Hippopus, *Mart.* Tridacna, *Da Costa.*

Ex. C. scapha, *Meuschen*, pl. 113, fig. 2. Shell, C. scapha, fig. 2, *a*, 2, *b*.

The byssal orifice in the animal is large, close to the umbo, occupying nearly the whole anterior side; the byssus is very large; the foot is small, finger-like, and grooved; and the adductor muscle is round, large, and central. The shell, according to Dr. Carpenter, is very dense, being so calcified as almost to obliterate every trace of organic structure. The species are found imbedded in coral-reefs in the Pacific and Indian Oceans, and in the China Sea. The shells often attain a large size, sometimes weighing upwards of 500 lbs., and measuring two feet across.

Species of Chametrachæa.

elongata, *Lam.*
gigas, *Linn.*
mutica, *Lam.*
scapha, *Meusch.*
scutrum, *Meusch*
serrifera, *Lam.*
squamosa, *Lam.*

Genus HIPPOPUS, Meuschen.

Shell equivalve, regular, trigonal; byssal sinus at the fore-part of valves, indistinct; surface of valves with imbricated, scaly, radiating ribs. Hinge composed of two compressed, unequal, primary teeth in each valve; ligament external, marginal.

Syn. Pelvis, *Mühlf.* Cerceis, *Gist.*

Ex. H. equinus, *Meuschen*, pl. 113, fig. 3. Shell, H. equinus, fig. 3, *a*, 3, *b*.

This genus is readily distinguished from the preceding by the absence of the byssal foramen, and by the double primary tooth of the hinge. The only species known is from the Indian Seas, where it inhabits the coral-reefs at low-water mark.

Order LUCINACEA.

Mantle-lobes free beneath, united posteriorly, forming a separate siphonal opening. Foot usually cylindrical, elongate, inferior. Anterior adductor muscle usually elongate.

Fam. LUCINIDÆ.

Labial palps small and rudimentary. Mantle-lobes free beneath, furnished behind with one or two sessile siphonal apertures; gills one on each side, large, oval, thick. Foot cylindrical, elongate, inferior, usually hollow throughout its entire length, the tube opening into the spaces of the visceral cavity.

Shell equivalve, free, regular, closed, more or less orbicular. Hinge and sculpture of surface variable; interior dull, or obliquely furrowed; ligament external, or subinternal. Muscular impressions very large, rough, elongated; pallial line simple.

Genus LUCINA, Bruguière.

Siphonal orifices simple, without a prolonged anal tube.

Shell orbicular, compressed; surface of valves variable; lunule distinct. Hinge usually composed of two diverging,

primary teeth, and two lateral teeth in each valve; ligament usually external. Muscular scars strongly marked, the anterior elongated; pallial impression simple.

Syn. Phacoides, *Blainville.*

Ex. L. Jamaicensis, *Spengler*, pl. 113, fig. 4, 4, *a.*

The species of *Lucina* have a wide geographical range, being found on the sands along the shores of most countries of the world. The shells differ considerably in form and sculpture, being either globose or lenticular, reticulated, ribbed, or laminated.

Species of Lucina.

annulata, *Reeve.*
argentea, *Reeve.*
aurantia, *Desh.*
bicornis, *Reeve.*
borealis, *Linn.*
columbella, *Lam.*
dentifera, *Jonas.*
emarginata, *Barth.*
funiculata, *Reeve.*
gemma, *Reeve.*
Jamaciensis, *Spengl.*
lactea, *A. Adams.*
Pensylvanica, *Linn.*
pisum, *Reeve.*
simplex, *Reeve.*
speciosa, *Reeve.*
sulcata, *Reeve.*
virgo, *Reeve.*

Sub-gen. CYCLAS, Klein, not Bruguière.

Shell with the surface of the valves obliquely and circularly, or divaricately striated.

arcuata, *Mont.*
digitalis, *Lam.*
digitaria, *Linn.*
divaricata, *Linn.*
eburnea, *Reeve.*
gibba, *Gray.*
ornata, *Reeve.*

Sub-gen. CODAKIA, Scopoli (Chama, *Mart.*, not *Linn.* Lentillaria, *Schum.*).

Shell compressed, with the surface of the valves radiately

ribbed, as well as concentrically striated. Ligament concealed between the valves.

Antillarum, *Reeve*.
exasperata, *Reeve*.
fibula, *Adams and Reeve*.
imbricatula, *C. B. Adams*.
insculpta, *Reeve*.
interrupta, *Lam*.
munda, *A. Adams*.
obliqua, *Reeve*.
occidentalis, *Reeve*.
pecten, *Lam*.
punctata, *Linn*.
ramulosa, *Gould*.
rugifera, *Reeve*.
tigerina, *Linn*.

Sub-gen. MILTHA, H. and A. Adams.

Shell inequivalve, with the surface of the valves nearly smooth. Hinge with the lateral teeth obsolete.

Childreni, *Gray*.

Sub-gen. MYRTEA, Turton (Cyrachæa, *Leach*).

Shell somewhat compressed, with the surface of the valves lamellated, imbricated, or decussated. Hinge with a single cardinal tooth in one valve, and two in the other.

fabula, *Reeve*.
Layardi, *A. Adams*.
lenticula, *Reeve*.
muricata, *Spengl*.
ochracea, *Reeve*.
scabra, *Lam*.
spinifera, *Mont*.
Strangei, *A. Adams*.
venusta, *Phil*.

Genus LORIPES, Poli.

Animal with a greatly-prolonged, contractile anal tube.

Shell thin, orbicular; surface of valves concentrically striated or lamellated; beaks small, inflexed; lunule short. Hinge with a single primary tooth in the right valve, and two very small primary teeth in the left valve; lateral

teeth rudimentary or none; cartilage in an oblique groove of the hinder hinge-margin; no external ligament.

Syn. Anodontia, *Link.*

Ex. L. lactea, *Linnæus*, pl. 114, fig. 1. Shell, L. lactea, fig. 1, *a*, 1, *b*.

The species of *Loripes*, which are not very numerous, are chiefly from the West Indies, the Mediterranean, and the Philippines.

Species of Loripes.

anatellinoides, *Reeve.*
barbata, *Reeve.*
bullula, *Reeve.*
chrysostoma, *Meusch.*
edentula, *Linn.*
globulosa, *A. Adams.*
lactea, *Linn.*
malum, *Reeve.*
ovulum, *Reeve.*
ovum, *Reeve.*
Philippiana, *Reeve.*
Philippinarum, *Hanley.*
pila, *Reeve.*
plicifera, *A. Adams.*
tumida, *Reeve.*

Genus CRYPTODON, Turton.

Siphonal orifice prolonged and tubular.

Shell thin, smooth, sub-orbicular, inequilateral; surface of valves with a radiating groove extending from the beaks to the hinder extremity; beaks small, acute; lunule rather large, sub-ovate. Hinge with a single erect, primary tooth in the right valve; ligament partly concealed by the overlapping margins of the valves. Anterior muscular impression double.

Syn. Thyatira, *Leach.* Bequania, *Leach.* Axinus, *J. Sow.* Ptychina, *Phil.* Clausina, *Jeffr.*

Ex. C. flexuosus, *Montagu*, pl. 114, fig. 2, 2, *a*.

Of the few species of this genus at present described, two are British, one is from Sweden, and one from Cuba.

Species of Cryptodon.

ferruginosus, *Forbes.*
flexuosus, *Mont.*
Gouldii, *Phil.*
Sarsii, *Lovén.*
trisinuatus, *D'Orb.*

Genus GAFRARIUM, Bolten.

Mantle open below, the margin doubly fringed; siphonal orifice single, with a long, retractile, tubular valve.

Shell transverse, equivalve, ventricose; surface of valves sculptured; beaks incurved; umbonal area with an oblique furrow; margins of valves denticulated internally. Hinge composed of two primary and two lateral teeth in each valve. Muscular scars round, polished; pallial line simple.

Syn. Fimbria, *Mühlf.*, not *Bohadsch.* Idothea, *Schum.* Corbis, *Cuv.*

Ex. G. fimbriatum, *Linnæus*, pl. 114, fig. 3, 3, *a*.

This genus is composed of few species, with elaborately-sculptured valves. The siphonal orifice of the animal is provided with a long, retractile, tubular valve; and the mantle-margin is furnished with a double fringe. The Eastern seas afford us examples.

Species of Gafrarium.

cælatum, *A. Adams.*
elegans, *Desh.*
fimbriatum, *Linn.*
scitulum, *A. Adams.*
Sowerbii, *Reeve.*

Fam. UNGULINIDÆ.

Mouth with four foliaceous, membranous palps. Mantle-margins united, with the exception of a large, inferior pedal opening and a small, sessile anal aperture; gills two pairs

on each side, united behind. Foot vermiform, ending in an erectile gland, channelled throughout its length.

Shell sub-orbicular. Hinge with two diverging, bifid primary teeth; lateral teeth none; cartilage marginal, linear. Siphonal inflection none, or rudimentary.

Genus UNGULINA, Daudin.

Mantle-margins fringed; palpi pointed.

Shell sub-orbicular; surface of valves covered with a thick, wrinkled, sometimes dark-coloured epidermis. Hinge-teeth two in each valve; ligament very short. Muscular impressions long, rugose.

Ex. U. rubra, *Roissy*, pl. 114, fig. 4, 4, *a*.

The species of *Ungulina* are found buried in sand and mud on the shores of the Mediterranean and the Red Sea. The foot is long, cylindrical, and tubular, with a sort of erectile gland at the extremity; and the palps are long and pointed.

Species of Ungulina.

alba, *Rang.*
rubra, *Roissy.*
transversa, *Lam.*

Genus SCACCHIA, Philippi.

Mantle widely open. Foot compressed, linguiform.

Shell ovate, transverse, thin, smooth, equivalve, inequilateral, slightly truncate posteriorly. Hinge with one or two small cardinal teeth in each valve; lateral teeth pliciform, or obsolete; ligament small, external; cartilage internal, inserted in an oblong pit. Muscular impressions small, rounded, sub-equal; pallial line simple, without a sinus.

Ex. S. elliptica, *Scacchi*, pl. 114, fig. 5, 5, *a*.

central excision in one valve; a primary apical tooth in front of a sub-triangular excision of the hinge-margin, and flanked on each side by a sub-lateral lamina in the other. Pallial impression simple.

Ex. L. squamosum, *Montagu*, pl. 115, fig. 1. Shell, L. squamosum, fig. 1, *a*, 1, *b*.

In *Lepton* the mantle is much produced beyond the margin of the shell, and is furnished with slender, tentacular filaments. The foot is folded as in *Arca*, but when the animal is in motion it forms an expanded disk.

Species of Lepton.

anomalum, *Desh.*
Clarkiæ, *Clark.*
convexum, *Alder.*
nitidum, *Turt.*
squamosum, *Mont.*

Genus TELLIMYA, Brown.

Mantle produced beyond the margin of the shell, fringed, and open freely anteriorly, with only one distinct and sessile siphonal orifice (anal). Foot large, broad, slightly geniculate, and furnished with a byssal groove.

Shell oval, white; surface of valves roughened at the margins with minute points; beaks prominent, pointed. Hinge composed of a cartilage-pit in each valve, and provided with an ossicle; a strong, triangular, pointed cardinal tooth on each side of the cartilage-pit in the right valve, and two rather distant, obsolete lateral teeth in the left valve.

Ex. T. bidentata, *Montagu*, pl. 115, fig. 2, 2, *a*.

In this genus the hinge is furnished with an ossicle as in the members of the family *Anatinidæ*, on which account Mr. W. Clark places it in that group. The peculiarities of

the animal, however, induce us to regard it as most nearly allied to *Lepton*.

Species of Tellimya.

bidentata, *Mont.* ferruginosa, *Mont.*

Fam. GALEOMMIDÆ.

Animal oval. Mouth with large lips, and developed labial palps. Mantle very large, double-margined, tuberculiferous, closed in front; siphonal openings posterior, two; two pairs of branchial leaflets. Foot long, ligulate, byssiferous, perforate, projecting from an anterior opening of the mantle.

Genus GALEOMMA, Turton.

Shell thin, transversely oval, equivalve, sub-equilateral, gaping widely in front; surface of valves longitudinally striated and decussated; beaks minute, acute. Cartilage-pits under the beaks, small; no hinge-teeth; ligament internal. Pallial impression simple.

Syn. Parthenope, *Scacchi.* Hiatella, *Costa,* not *Daud.* or *Brown.*

Ex. G. Turtoni, *Sowerby,* pl. 115, fig. 3. Shell, G. Turtoni, fig. 3, *a*, 3, *b*.

The mantle in *Galeomma* is extended beyond the edges of the shell, and the margins are furnished with ocelli or tubercles. The foot is byssiferous, and the animal, generally, has resemblances to that of the *Arcidæ*.

Species of Galeomma.

ambigua, *Desh.* argentea, *Desh.*
angusta, *Desh.* aurantia, *Lam.*

chloroleuca, *Desh.*
formosa, *Desh.*
indecora, *Desh.*
inflata, *Desh.*
Layardi, *Desh.*
machrochisma, *Desh.*
paucistriata, *Desh.*
polita, *Desh.*
splendida, *Desh.*
Turtoni, *Sow.*

Genus SCINTILLA, Deshayes.

Animal unknown.

Shell transversely ovate, obtuse, somewhat gaping at both sides, tumid, thin, very shining, destitute of epidermis; superior margin usually straight; inferior parallel, and never emarginate in the middle. Hinge narrow, short; in the right valve a single, porrect, uncinate cardinal tooth; in the left two, unequal, approximate, divaricate teeth, the internal the larger; a lateral tooth, short, conical, or subquadrangular, on the hind side near the hinge, received into the follicle of the bifid tooth in the other valve; ligament internal, short, broad, thin, affixed in a narrow, oblique groove in each valve. Pallial impression entire.

Ex. S. Philippinensis, *Deshayes*, pl. 115, fig. 4, 4, *a*.

One species of this genus appears to have been known to M. Quoy, and was described by him under the name of *Psammobia vitrea*, but was said to have two cardinal teeth, and an external ligament. The animal, according to him, approached that of *Galeomma*, and is certainly far from being a true *Psammobia*. The shells of the genus *Scintilla* have a peculiar appearance, which distinguishes them from all other known genera. They have an affinity on one side with *Erycina*, as reconstructed by M. Recluz, and on the other side with *Galeomma*, and are, apparently, intermediate between the groups. There is a singularity in the external appearance of some of the species,

which consists of a multitude of very fine punctations, of an opaque white colour, upon the shells, and which deprives them, in such portions, of their transparency. There does not appear to be any ossicle to the hinge. (Desh.)

Species of Scintilla.

Adamsi, *Desh.*
aurantiaca, *Desh.*
candida, *Desh.*
crocea, *Desh.*
crystallina, *Desh.*
Cumingii, *Desh.*
Cuvieri, *Desh.*
faba, *Desh.*
flavida, *Desh.*
Forbesii, *Desh.*
Hanleyi, *Desh.*
hyalina, *Desh.*
hydatina, *Desh.*
hydrophana, *Desh.*
Jukesi, *Desh.*
opalina, *Desh.*
ovulina, *Desh.*
Owenii, *Desh.*
pallidula, *Desh.*
pellicula, *Desh.*
Philippinensis, *Desh.*
porulosa, *Desh.*
pudica, *Desh.*
Recluziana, *Desh.*
Reevei, *Desh.*
rosea, *Desh.*
scintillans, *Desh.*
solidula, *Desh.*
Strangei, *Desh.*
striatina, *Desh.*
succinea, *Desh.*
tenuis, *Desh.*
Timorensis, *Desh.*
turgescens, *Desh.*
turgida, *Desh.*
vitrea, *Quoy.*

Fam. SOLEMYIDÆ.

Palpi very small and slender. Mantle closed, except at a large opening with cirrhated edges, anteriorly, for the passage of the foot, and at a single small opening at the posterior extremity, also cirrhated; gills forming a very thick lobe on each side, situated far posteriorly, and having a longitudinal sulcus in the middle of each. Foot large, truncated and excavated at its extremity which has fimbriated edges.

Genus SOLEMYA, Lamarck.

Shell equivalve, inequilateral, transversely oblong, obtuse at the extremities; valves covered with a shining, brown epidermis which extends beyond the margins. Hinge with a cardinal tooth in each valve, and a callosity running between them, which receives the ligament, showing it both externally and internally.

Syn. Solenomya, *Mke.* Solenymia, *Swains.*

Ex. S. solen, *Salis-Marchlius*, pl. 115, fig. 5. Shell, S. solen, fig. 5, *a*, 5, *b*.

Stimpson observes, that the thinness of the shell enables the animal to make surprising leaps, and that he has seen it leaping or swimming about in the water for some time without touching the bottom. The leap is performed by suddenly drawing in the umbrella-shaped foot at the same time that water is expelled from the posterior opening by the closing of the valves. In this genus the posterior side of the shell is the shorter, and the epidermis is greatly developed and extended beyond the margin of the valves. There are four species known, from the United States, New Zealand, New Holland, the Mediterranean, and the Gaboon River in Western Africa. The animals are usually found burrowing in mud, in about two fathoms of water.

Species of Solemya.

australis, *Lam.*
borealis, *Tott.*
solen, *Salis-March.*
velum, *Say.*

Fam. ASTARTIDÆ.

Labial palps plicate, short, triangular. Lobes of mantle disunited in their entire length, the branchial margin bearded; gills two pairs, rounded in front, tapering and free behind the body. Foot conical, compressed, rather angulated behind.

Shell free, oblong or cordate, thick; surface of valves often concentrically ribbed, and covered with a brown epidermis. Hinge with strongly-developed cardinal teeth. Pallial impression quite entire, or with only a slight indication of a sinus.

Marine.

Genus ASTARTE, J. Sowerby.

Shell solid, closed, oblong, sub-orbicular or triangular, equivalve; surface of valves smooth or transversely furrowed, covered with a thick, brown epidermis; lunule almost always distinct. Hinge composed of two strong, diverging primary teeth in one valve, and a primary tooth in the other; ligament external, elongated, usually lodged in a lozenge. Muscular impressions ovate, strongly marked; pallial line simple.

Syn. Crassina, *Lam.* Tridonta, *Schum.* Mactrina, *Brown.* Goodallia, *Turton.* Nicania, *Leach.*

Ex. A. sulcata, *Da Costa*, pl. 115, fig. 6. Shell, A. sulcata, fig. 6, *a*, 6, *b*.

The species of *Astarte* are found in sandy mud in Northern Seas; on the shores of Norway, Greenland, Northern Europe, and North America. The valves of the shell are nearly always covered with a dark, chest-

nut-brown epidermis on a colourless surface; the muscular impressions are strongly marked; the dorsal area and lunule are excavated; and the inner margin of the valves is sometimes crenulated.

Species of Astarte.

arctica, *Gray.*
Banksii, *Leach.*
bilunata, *Conr.*
castanea, *Say.*
compressa, *Mont.*
crebricostata, *Forbes.*
elliptica, *Brown.*
fusca, *Poli.*
intermedia, *Sow. Jun.*
lactea, *Brod. and Sow.*
mactracea, *Linsl.*
oblonga, *Sow. Jun.*
Pfeifferi, *Phil.*
Portlandica, *Migh.*
quadrans, *Gould.*
semisulcata, *Leach.*
subæquilatera, *Sow. Jun.*
sulcata, *Da Costa.*
triangularis, *Mont.*
undata, *Gould.*

Genus GOULDIA, C. B. Adams.

Mantle-margin denticulated; siphons very short, disunited, their margins ciliated. Foot linguiform.

Shell sub-trigonal, equivalve; surface of valves concentrically striated or laminated; lunule distinct. Hinge composed of two primary teeth in one valve, and one in the other; and two anterior, remote lateral teeth, one in each valve. Pallial line simple, or very slightly sinuated.

Syn. Thetis, *C. B. Adams*, not *Sowerby.*

Ex. G. minima, *Montagu*, pl. 115, fig. 7. Shell, G. Pacifica, *C. B. Adams*, fig. 7, *a*, 7, *b*.

The species of *Gouldia* are few in number. One, *G. minima*, is met with on the coasts of Britain, the others are from the West Indies, and Mazatlan.

Species of Gouldia.

cerina, *C. B. Adams.*
Guadaloupensis, *D'Orb.*
Martinicensis, *D'Orb.*
minima, *Mont.*
Pacifica, *C. B. Adams.*
parva, *C. B. Adams.*
varians, *Cpr.*

Genus CRASSATELLA, Lamarck.

Shell solid, closed, equivalve, attenuated behind; surface of valves smooth, or furrowed concentrically; margins simple, or crenulated; lunule distinct. Hinge composed of two sub-diverging, striated primary teeth placed in front of a cartilage-pit; lateral teeth usually one in each valve; ligament internal, inserted in a pit in each valve. Muscular impressions strong, rounded; pallial line simple.

Syn. Ptychomya, *Agassiz* (fossil). Paphia, *Roissy*, not *Lam.* or *Fabr.*

Ex. C. pulchra, *Reeve*, pl. 116, fig. 1. Shell, C. Kingicola, *Lamarck*, fig. 1, *a*, 1, *b*.

In this genus the mantle is entirely open, with the inhalent margins cirrhated; the palpi are triangular; and the foot is compressed, triangular, and grooved. The species are usually dredged from deep water, and are most numerous in the Australian Seas; four, however, have been obtained from Asia, three from America, and one from Africa; while none have hitherto been detected in Europe. The genus is found in a fossil state in the Neocomian of Patagonia and the South of Europe.

Species of Crassatella.

Antillarum, *Reeve.*
bellula, *A. Adams.*
castanea, *Reeve.*
compressa, *Adams and Reeve.*
compta, *A. Adams.*
concinna, *A. Adams.*
corbuloides, *Reeve.*
corrugata, *Adams and Reeve.*
Cumingii, *A. Adams.*
decipiens, *Reeve.*
divaricata, *Chem.*
donacina, *Lam.*
gibbosa, *Sow.*
jubar, *Reeve.*
Kingicola, *Lam.*
lævis, *A. Adams.*
lapidea, *Reeve.*
nana, *Adams and Reeve.*
obscura, *A. Adams.*
ornata, *Gray.*
pallida, *Adams and Reeve.*
picta, *Adams and Reeve.*
pulchra, *Reeve.*
radiata, *Sow.*
rostrata, *Lam.*
speciosa, *A. Adams.*
subradiata, *Lam.*
sulcata, *Lam.*
triquetra, *Reeve.*
truncata, *A. Adams.*
undulata, *Sow.*
zic-zac, *Reeve.*

Genus ACTINOBOLUS, Klein.

Foot sickle-shaped, not byssiferous.

Shell equivalve, inequilateral, ovate or cordate; surface of valves with strong radiating ribs. Hinge with two oblique cardinal teeth directed towards the same side, hinder cardinal tooth in left valve triangular, single, elongate; lateral teeth none.

Syn. Cardita, *Lam.*, not *Brug.* Cardiocardites, *Blainv.* Agaria, *Gray.*

Ex. A. sulcatus, *Lamarck*, pl. 116, fig. 2. Shell, A. ajar, *Adanson*, fig. 2, *a*, 2, *b*.

The genus *Venericardia*, as properly restricted, is entirely extinct, the species referred to that genus by Lamarck (*V. antiquata*) belonging to the *Actinobolus* of Klein.

The species of *Actinobolus* are usually obtained from deep water, and are most numerous in the Chinese and Australian Seas, though some are found on the shores of North America, and in the West Indies.

Species of Actinobolus.

abyssicola, *Hinds.*
aculeatus, *Phil.*
ajar, *Adams.*
amabilis, *Desh.*
angisulcatus, *Reeve.*
antiquatus, *Linn.*
australis, *Quoy.*
Belcheri, *Desh.*
bimaculatus, *Desh.*
borealis, *Conr.*
canaliculatus, *Reeve.*
cardioides, *Reeve.*
castoruca, *Desh.*
compressus, *Reeve.*
Conradi, *Shuttl.*
corbis, *Phil.*
crassus, *Gray.*
crenulatus, *Desh.*
Cumingii, *Desh.*
Cuvieri, *Brod.*
difficilis, *Desh.*
elegantulus, *Desh.*
ferruginosus, *Adams and Reeve.*
flabellum, *Reeve.*
flammeus, *Mich.*
gibbosus, *Reeve.*
Gunnii, *Desh.*
incrassatus, *Sow.*
Jukesii, *Desh.*
Koreënsis, *Desh.*
lacunosus, *Reeve.*
laticostatus, *Sow.*
marmoreus, *Reeve.*
megastrophus, *Gray.*
nitidus, *Reeve.*
nodulosus, *Reeve.*
ovalis, *Reeve.*
Preissii, *Mke.*
procerus, *Gould.*
purpuratus, *Desh.*
rostratus, *Gmel.*
semen, *Reeve.*
Sowerbyi, *Desh.*
spurcus, *Sow.*
squamifer, *Desh.*
sulcatus, *Lam.*
tegulatus, *Reeve.*
tricolor, *Sow.*
tridentatus, *Say.*
tumidus, *Brod.*
varius, *Brod.*
ventricosus, *Gould.*
vestitus, *Desh.*
Zelandicus, *Desh.*

Genus MYTILICARDIA, Blainville.

Foot rounded, grooved, byssiferous.

Shell elongate, oblong, very inequilateral, strongly costate, ribs scaly. Hinge with the front cardinal tooth triangular, diverging; hinder cardinal tooth in the left valve double, both laminæ being equally developed, and elongate; anterior lateral tooth wanting.

Syn. Mytilocardita, *Anton.* Jesonia, *Gray.*

Ex. M. calyculata, *Bruguière,* pl. 116, fig. 3, 3, *a.*

The species of *Mytilicardia* are widely distributed, being met with in the Mediterranean and Red Seas, the Philippines, the islands of the Pacific, and on the coasts of Africa and South America.

Species of Mytilicardia.

calyculata, *Brug.*
crassicostata, *Lam.*
distorta, *Reeve.*
Essingtonensis, *Desh.*
excavata, *Desh.*
excisa, *Phil.*
fabula, *Reeve.*
Jeson, *Adams.*
muricata, *Sow.*
pica, *Reeve.*
radula, *Reeve.*
rufescens, *Reeve.*
teretiuscula, *Phil.*
umbilicata, *Desh.*
variegata, *Brug.*

Sub-gen. BEGUINA, Bolten (Azarella, *Gray*).

Shell roundish, compressed, striated, dilated behind. Front hinge-tooth elongate, compressed, similar and parallel to the hinder; lateral teeth none.

gubernaculum, *Reeve.*
semiorbiculata, *Linn.*
volucris, *Reeve.*

Sub-gen. GLANS, Mühlfeldt.

Shell trapeziform, with radiating, crenulated ribs; margin of valves plicate.

naviformis, *Reeve.* trapezia, *Linn.*

Sub-gen. THECALIA, H. and A. Adams.

Shell oblong, radiately ribbed; interior of valves folded on themselves, forming a receptable for the ova.

concamerata, *Chem.*

Genus LAZARIA, Gray.

Shell transversely oblong, strongly costate. Hinge with the front cardinal tooth compressed; anterior lateral tooth distinct.

Ex. L. radiata, *Broderip*, pl. 116, fig. 4, 4, *a*.

The genus *Lazaria* comprises but few species, chiefly from Madagascar and South America.

Species of Lazaria

affinis, *Brod.*
Californica, *Desh.*
gracilis, *Shuttl.*
pectunculus, *Brug.*
radiata, *Brod.*

Fam. UNIONIDÆ.

Labial palps wider than long, usually united as far as the middle of their hind margins. Mantle-lobes entirely disunited, not produced into siphonal tubes, the branchial

region fringed with cirrhi, the anal plain. Foot large, thick, tongue-shaped, somewhat produced anteriorly, not provided with a byssal groove.

Shell equivalve, covered externally with an epidermis; pearly in the inside of the valves; hinge variable.

Fresh-water.

Sub-fam. UNIONINÆ.

Foot moderate.

Genus UNIO, Retzius.

Outer gill united to the mantle as far as its extremity; inner gill not united to the foot.

Shell equivalve, inequilateral, variable in shape, covered with an olivaceous epidermis; beaks usually eroded. Hinge with primary teeth, and with elongated laterals; ligament external, more or less elongated. Pallial impression simple; muscular scars conspicuous.

Syn. Elliptio, Eurynea, *Rafin.* Mysca, *Turt.* Margaron (part), *Lea.* Mya, *Humph.*, not *Linn.* Lymnium, *Oken.* Luticola, *Goldf.* Cunicula, Legumia, *Swains.*

Ex. U. pictorum, *Linnæus*, pl. 116, fig. 5. Shell, U. pictorum, fig. 5, *a*, 5, *b*.

M. Agassiz observes, that in this extensive genus of fluviatile bivalve shells the gills are free from the abdominal sac, their posterior extremity being attached to the mantle. The eggs in the female fill the whole extent of the outer gill. The inside of the valves is covered with a thick, often iridescent nacre, and the character of the hinge-teeth is very variable. The greatest number of species inhabit

the lakes and rivers of North America; about five are from Africa; at least ten undisputed species are European; two only are from New Holland; upwards of forty are from the fresh waters of Asia; and nearly thirty are South American in their geographical distribution.

Species of Unio.

aheneus, *Lea.*
angustatus, *Lea.*
arctatus, *Conr.*
arctior, *Lea.*
arcus, *Conr.*
Barrattii, *Lea.*
bilineatus, *Lea.*
Cailliaudii, *Férus.*
Corrianus, *Lea.*
dactylus, *Lea.*
Duttonianus, *Lea.*
elongatus, *Pfeiff.*
fatuus, *Lea.*
Fisherianus, *Lea.*
folliculatus, *Lea.*
gibbosus, *Barnes.*
Ingallsianus, *Lea.*
iris, *Lea.*
Jayensis, *Lea.*
lanceolatus, *Lea.*
lugubris, *Lea.*
marginalis, *Lea.*
nasutus, *Say.*
orientalis, *Lea.*
parallelopipedon, *D'Orb.*
Patagonicus, *D'Orb.*
perstriatus, *Lea.*
phaseolus, *Hild.*
pictorum, *Linn.*
platyrhynchus, *Rossm.*
productus, *Conr.*
rectus, *Lam.*
sagittiformis, *Lea.*
Shepardianus, *Lea.*
strigosus, *Lea.*
tenuissimus, *Lea.*
teres, *Rafin.*
tumidus, *Retz.*
Vaughanianus, *Lea.*

Sub-gen. BARIOSTA, Rafinesque (Potamida, *Swains.*).

Shell not winged, arcuated; surface of valves smooth.

crassus, *Retz.*
emarginatus, *Lea.*
Fellmanni, *Desh.*
Lazarus, *Lea.*
monodontus, *Say.*

Sub-gen. NAIDEA, Swainson.

Shell not winged, ob-ovate; surface of valves smooth.

amygdalum, *Lea.*
biangulatus, *Lea.*
Boydianus, *Lea.*
contradens, *Lea.*
cuprinus, *Lea.*
Floridensis, *Lea.*
foliaceus, *Gould.*
hyalinus, *Lea.*
lenior, *Lea.*
modioliformis, *Lea.*
nigrinus, *Lea.*
obtusus, *Lea.*
papyraceus, *Gould.*
pellucidus, *Lea.*
rhombeus, *Wag.*
Tappanianus, *Lea.*
tenerus, *Rav.*
ventricosus, *Soland.*

Sub-gen. OBOVARIA, Rafinesque (Rhipidodonta, *Mörch*).

Shell not winged, sub-rotund; surface of valves smooth.

circulus, *Lea.*
coccineus, *Lea.*
dolabelloides, *Lea.*
ebenus, *Lea.*
Kirtlandianus, *Lea.*
lens, *Lea.*
Lesueurianus, *Lea.*
Masoni, *Conr.*
membranaceus, *Maton.*
nucleopsis, *Conr.*
Paranensis, *Lea.*
personatus, *Say.*
pilaris, *Lea.*
rotundatus, *Lam.*
rubellus, *Conr.*
subrotundus, *Lea.*
torsus, *Rafin.*
unicolor, *Lea.*
variabilis, *Maton.*

Sub-gen. NIÄA, Swainson.

Shell not winged, oblong; surface of valves smooth.

angustus, *Lam.*
atratus, *Swains.*
auratus, *Swains.*
Blandingianus, *Lea.*
brevidens, *Lea.*
Buddianus, *Lea.*
callosus, *Lea.*
camptodon, *Say.*

complanatus, *Soland.*
confertus, *Lea.*
Congaræus, *Lea.*
corrugatus, *Retz.*
cultelliformis, *Conr.*
Cuvierianus, *Lea.*
Dariensis, *Lea.*
declivis, *Say.*
depressus, *Lam.*
exolescens, *Gould.*
famelicus, *Gould.*
fraternus, *Lea.*
fuliginosus, *Lea.*
fulvus, *Lea.*
Geddingsianus, *Lea.*
Gibbesianus, *Lea.*
Griffithianus, *Lea.*
Hopetonensis, *Lea.*
jejunus, *Lea.*
limatulus, *Conr.*
litoralis, *Drap.*
lutulentus, *Gould.*
modestus, *Férus.*
neglectus, *Lea.*
obesus, *Lea.*
occidentalis, *Conr.*
paliatus, *Raven.*
paludicolus, *Gould.*
Roanokensis, *Lea.*
rufusculus, *Lea.*
sordidus, *Lea.*
subplanus, *Conr.*
symmetricus, *Lea.*
tetralasmus, *Say.*
tortivus, *Lea.*
Tuomeyi, *Lea.*
Watereensis, *Lea.*
Whiteianus, *Lea.*

Sub-gen. HYRIDELLA, Swainson (Micromya, *Agass.*).

Shell not winged, oval; surface of valves smooth.

affinis, *Lea.*
altilis, *Conr.*
amœnus, *Lea.*
approximus, *Lea.*
aratus, *Lea.*
australis, *Lam.*
Batavus, *Lam.*
Bengalensis, *Lea.*
Binneyi, *Lea.*
Bonneaudii, *Eyd.*
Brumbyanus, *Lea.*
Bucklyi, *Lea.*
Burroughianus, *Lea.*
buxeus, *Lea.*
cæruleus, *Lea.*
Caffer, *Krauss.*
caliginosus, *Lea.*
capax, *Green.*
capsæformis, *Lea.*
cariosus, *Say.*
charruanus, *D'Orb.*
Childreni, *Gray.*
Claibornensis, *Lea.*
Clarkianus, *Lea.*
concavus, *Lea.*
constrictus, *Conr.*
creperus, *Lea.*
crocatus, *Lea.*
Cumberlandianus, *Lea.*
delodontus, *Lam.*

discus, *Lea.*
divaricatus, *Lea.*
dolabræformis, *Lea.*
Egyptiacus, *Caill.*
exiguus, *Lea.*
exilis, *Dkr.*
faba, *D'Orb.*
fabalis, *Lea.*
flavescens, *Lea.*
fuscatus, *Lea.*
Gaudichaudii, *Eyd.*
Georgianus, *Lea.*
glaber, *Lea.*
glans, *Lea.*
Gouldii, *Lea.*
Greenii, *Conr.*
Haleianus, *Lea.*
hebes, *Lea.*
Hydianus, *Lea.*
ineptus, *Lea.*
interruptus, *Lea.*
Javanus, *Lea.*
Keraudreni, *Eyd.*
lamellatus, *Lea.*
Lecontianus, *Lea.*
lienosus, *Conr.*
ligamentinus, *Lam.*
lineatus, *Lea.*
luridus, *Lea.*
luteolus, *Lam.*
Medellinus, *Lea.*
Menkianus, *Lea.*
minor, *Lea.*
Mississippiensis, *Conr.*
mœstus, *Lea.*
Monroensis, *Lea.*
Moussonianus, *Lea.*
Mühlfeldtianus, *Lea.*
multidentatus, *Phil.*
multiradiatus, *Lea.*
mutatus, *Mouss.*
Nashvillianus, *Lea.*
nigellus, *Lea.*
nigerrimus, *Lea.*
Niloticus, *Caill.*
nitens, *Lea.*
notatus, *Lea.*
Novi-Eboraci, *Lea.*
nux, *Lea.*
obscurus, *Lea.*
occidens, *Lea.*
occultus, *Lea.*
ochraceus, *Say.*
olivarius, *Lea.*
orbiculatus, *Hild.*
Oregonensis, *Lea.*
pallescens, *Lea.*
parvus, *Barnes.*
paulus, *Lea.*
perdix, *Lea.*
perovalis, *Conr.*
perovatus, *Conr.*
Petterianus, *Küst.*
pictus, *Lea.*
placitus, *Lea.*
Powellii, *Lea.*
Prevostianus, *Lea.*
productior, *Mouss.*
profugus, *Lea.*
proximus, *Lea.*
pulcher, *Lea.*
pullus, *Conr.*
pusillus, *Lea.*
radiatus, *Gmel.*
Reeveianus, *Lea.*
regularis, *Lea.*
Sapotalensis, *Lea.*
saxeus, *Conr.*
simplex, *Lea.*
simus, *Lea.*

Smithii, *Gray.*
spatulatus, *Lea.*
splendidus, *Lea.*
stagnalis, *Conr.*
Stonensis, *Lea.*
stramineus, *Conr.*
subangulatus, *Lea.*
Tampicoensis, *Lea.*
Tecomatensis, *Lea.*
tener, *Lea.*
Tennesseensis, *Lea.*
Vanuxemensis, *Lea.*
ventricosus, *Barnes.*
venustus, *Lea.*
vibex, *Conr.*
Zeiglerianus, *Lea.*

Sub-gen. LAMPSILIS, Rafinesque (Truncilla, Pleurobema, Syntoxia, Scalenaria, Plagiola, *Rafin.* Unio, *Lam.*, not *Retz.* Crenodonta, *Schlüt.* Æglia, *Swains.*).

Shell not winged, more or less triangular or oblique, and truncate at one end; surface of valves smooth.

abacus, *Hald.*
arcæformis, *Lea.*
argenteus, *Lea.*
Barnesianus, *Lea.*
Bigbyensis, *Lea.*
Bournianus, *Lea.*
camelus, *Lea.*
castaneus, *Lea.*
clavus, *Lam.*
compressissimus, *Lea.*
cor, *Conr.*
crassidens, *Lam.*
cuneolus, *Lea.*
cyrenoides, *Phil.*
decisus, *Lea.*
donaciformis, *Lea.*
Edgarianus, *Lea.*
elegans, *Lea.*
ellipsis, *Lea.*
Estabrookianus, *Lea.*
Forbesianus, *Lea.*
Foremanianus, *Lea.*
fulgidus, *Lea.*
gibber, *Lea.*
Hanleyianus, *Lea.*
Haysianus, *Lea.*
heterodon, *Lea.*
Holstonensis, *Lea.*
incrassatus, *Lea.*
maculatus, *Conr.*
mytiloides, *Rafin.*
obliquus, *Lam.*
Orbignyii, *Dev. and Hup.*
ovatus, *Say.*
oviformis, *Conr.*
patulus, *Lea.*
penitus, *Conr.*
pileus, *Lea.*
plenus, *Lea.*
pulvinulus, *Lea.*
pumilis, *Lea.*
pyramidatus, *Lea.*
Rajahensis, *Lea.*
Rangianus, *Lea.*
Ravenelianus, *Lea.*
rubiginosus, *Lea.*

satur, *Lea.*
securis, *Lea.*
solidus, *Lea.*
Sowerbianus, *Lea.*
striatus, *Lea.*
subovatus, *Lea.*
succissus, *Lea.*
sulcatus, *Lea.*
Taitianus, *Lea.*
tigris, *Férus.*
trigonus, *Lea.*
triqueter, *Rafin.*
Troschelianus, *Lea*
Troostensis, *Lea.*
trossulus, *Lea.*
truncatus, *Swains.*
tumescens, *Lea.*
zigzag, *Lea.*

Sub-gen. CANTHYRIA, Swainson.

Shell not winged, sub-trigonal; surface of valves spinous. Cardinal teeth long, compressed.

collinus, *Conr.*
spinosus, *Lea.*

Sub-gen. IRIDEA, Swainson (Tritogenia, Orthonymus, *Agass.*).

Shell not winged, wide; surface of valves nodulous.

cylindricus, *Say.*
granosus, *Brug.*
Leaii, *Gray.*
Novæ Hollandiæ, *Gray.*
verrucosus, *Rafin.*

Sub-gen. ROTUNDARIA, Rafinesque (Cyprogenia, *Agass.*).

Shell not winged, sub-rotund or oblique; surface of valves nodulous.

Æsopus, *Green.*
caperatus, *Lea.*
Cooperianus, *Lea.*
dromas, *Lea.*
graniferus, *Lea.*
Kienerianus, *Lea.*
Lamarckianus, *Lea.*
nodulosus, *Wood.*
perplexus, *Lea.*
pustulosus, *Lea.*
stegarius, *Rafin.*
tuberculatus, *Rafin.*
turgidus, *Lea.*
varicosus, *Lea.*

Smithii, *Gray.*
spatulatus, *Lea.*
splendidus, *Lea.*
stagnalis, *Conr.*
Stonensis, *Lea.*
stramineus, *Conr.*
subangulatus, *Lea.*
Tampicoensis, *Lea.*
Tecomatensis, *Lea.*
tener, *Lea.*
Tennesseensis, *Lea.*
Vanuxemensis, *Lea.*
ventricosus, *Barnes.*
venustus, *Lea.*
vibex, *Conr.*
Zeiglerianus, *Lea.*

Sub-gen. LAMPSILIS, Rafinesque (Truncilla, Pleurobema, Syntoxia, Scalenaria, Plagiola, *Rafin.* Unio, *Lam.*, not *Retz.* Crenodonta, *Schlüt.* Æglia, *Swains.*).

Shell not winged, more or less triangular or oblique, and truncate at one end; surface of valves smooth.

abacus, *Hald.*
arcæformis, *Lea.*
argenteus, *Lea.*
Barnesianus, *Lea.*
Bigbyensis, *Lea.*
Bournianus, *Lea.*
camelus, *Lea.*
castaneus, *Lea.*
clavus, *Lam.*
compressissimus, *Lea.*
cor, *Conr.*
crassidens, *Lam.*
cuneolus, *Lea.*
cyrenoides, *Phil.*
decisus, *Lea.*
donaciformis, *Lea.*
Edgarianus, *Lea.*
elegans, *Lea.*
ellipsis, *Lea.*
Estabrookianus, *Lea.*
Forbesianus, *Lea.*
Foremanianus, *Lea.*
fulgidus, *Lea.*
gibber, *Lea.*
Hanleyianus, *Lea.*
Haysianus, *Lea.*
heterodon, *Lea.*
Holstonensis, *Lea.*
incrassatus, *Lea.*
maculatus, *Conr.*
mytiloides, *Rafin.*
obliquus, *Lam.*
Orbignyii, *Dev. and Hup.*
ovatus, *Say.*
oviformis, *Conr.*
patulus, *Lea.*
penitus, *Conr.*
pileus, *Lea.*
plenus, *Lea.*
pulvinulus, *Lea.*
pumilis, *Lea.*
pyramidatus, *Lea.*
Rajahensis, *Lea.*
Rangianus, *Lea.*
Ravenelianus, *Lea.*
rubiginosus, *Lea.*

Kleinianus, *Lea.*
multiplicatus, *Lea.*
Napeanensis, *Conr*
perplicatus, *Conr.*
plicatus, *Lesueur.*
Stewardsonii, *Lea.*
undulatus, *Barnes.*

Sub-gen. METAPTERA, Rafinesque (Proptera, *Raf.* Lymnadia, Megadomus, *Swains.*).

Shell with the hind hinge-margin elevated and winged; the valves connate, the surface plicate or smooth.

alatus, *Say.*
atromarginatus, *Lea.*
Boykinianus, *Lea.*
Cumingii, *Lea.*
decoratus, *Lea.*
delphinus, *Gruner.*
gigas, *Lea.*
gracilis, *Barnes.*
inflatus, *Lea.*
lævissimus, *Lea.*
Nicklinianus, *Lea.*
pressus, *Lea.*
psammoicus, *D'Orb.*
superbus, *Lea.*

Genus BYSSANODONTA, D'Orbigny.

Animal resembling that of *Anodonta*, but remaining always attached by a byssus.

Shell sub-rotund, inequilateral; beaks elevated, folded, retuse. Hinge with the cardinal teeth recurved, double in both valves; the lateral teeth rather long and curved; ligament thin.

Syn. Byssodonta, (*D'Orb.*) *Gray.*

Ex. B. Paranensis, *D'Orbigny*, pl. 117, fig. 1, 1, *a*.

This remarkable byssiferous fresh-water bivalve was observed by M. D'Orbigny in the Rio Parana, above Corrientes.

Genus BAPHIA, Meuschen.

Gills generally free from the abdominal sac, and their posterior extremity not united to the mantle; anal opening not fringed, branchial mostly fringed.

Shell transverse, oblong, equivalve, covered with an olivaceous epidermis. Hinge with a single cardinal tooth in the right valve, broad, erect, and grooved at its apex; twin teeth of left valve strong, the hinder denticulated, the front narrower, entire, pointed; lateral teeth not developed.

Syn. Margaritana, *Schum.* Unio, *Oken*, not *Retz.* Damalis, *Leach*, Hemilastena, *Rafin.*

Ex. B. margaritifera, *Linnæus*, pl. 117, fig. 2, 2, *a.*

Of *Baphia* there are two undoubted species in the fresh-waters of Europe, besides numerous reputed species; all the others are from the rivers and lakes of North America.

Species of Baphia.

Bonellii, *Férus.*
dehiscens, *Lea.*
fabula, *Lea.*
Hildrethiana, *Lea.*
Holstonia, *Lea.*
margaritifera, *Linn.*

Sub-gen. ALASMODONTA, Say.

Shell trigonal, nearly equilateral; surface of valves smooth; beaks large, prominent. Hinge with two cardinal teeth.

Curreyana, *Lea.*
deltoidea, *Lea.*
minor, *Lea.*
undulata, *Lea.*

Sub-gen. COMPLANARIA, Swainson.

Shell oblong; the valves connate, the surface plicate. Cardinal teeth, two or three; lateral teeth represented by irregular grooves.

arcula, *Lea.*
complanata, *Barnes.*
confragosa, *Say.*
marginata, *Say.*
rugosa, *Barnes.*

Sub-gen. CALCEOLA, Swainson (Uniopsis, *Swains.*).

Shell ovate; surface of valves smooth. Cardinal teeth two, irregular or receding from the anterior margin, or with tubercles and undulations representing cardinal teeth.

calceola, *Lea.*
radiata, *Lea.*
Raveneliana, *Lea.*

Genus MONOCONDYLÆA, D'Orbigny.

Shell equivalve, inequilateral, sub-rotund or angulated, covered with a dark epidermis. Hinge composed of a large, obtuse, round cardinal tooth in each valve; lateral teeth none.

Syn.? Aplodon, *Spix.* Monodontina, *Conr.*

Ex. M. Guarayana, *D'Orbigny*, pl. 117, fig. 3. Shell, M. Paraguayana, *D'Orbigny*, fig. 3, *a*, 3, *b*.

All the species of this genus known are from the rivers of South America.

Species of Monocondylæa.

Corrientesensis, *D'Orb.*
fossiculifera, *D'Orb.*
Franciscana, *Moric.*
glauca, *Gould.*
Guarayana, *D'Orb.*
Minuana, *D'Orb.*
Paraguayana, *D'Orb.*
Parchappii, *D'Orb.*
Vondenbuschiana, *Lea.*

Genus BARBALA, Humphrey.

Animal unknown.

Shell with the valves generally winged and connate. Hinge with a single linear tooth under the dorsal margin, extending the whole length.

Syn. Barbata, *Sow.* Cristaria, *Schum.* Appius, *Leach.* Dianisotis, *Rafin.* Dipsas, *Leach*, not *Laur.* Symphynota, *Swains.*, not *Lea.* Dipsax, *Voigt.*

Ex. B. plicata, *Humphrey*, pl. 117, fig. 4, 4, *a.*

The species of this genus are all Asiatic in their geographical distribution.

Species of Barbala.

discoidea, *Lea.*
Largillierti, *Phil.*
plicata, *Humph.*

Genus ANODONTA, Bruguière.

Gills free; eggs received throughout the gill; anal opening not fringed.

Shell equivalve, ovate, usually rather thin, auriculate, inequilateral, closed; beaks small. Hinge without teeth,

but furnished with a lamina; ligament external, linear. Pallial impression simple.

Syn. Anodon, *Oken.* Limnæa, Limnæoderma, *Poli.* Strophitus, Lastena, Limella, *Rafin.* Hemiodon, *Swains.* Anodontina, *Schlüt.* Craspedodonta, *Küst.* Pseudodon, *Gould.* Glochidium (fry), *Rathke.*

Ex. A. cygnea, *Linnæus*, pl. 118, fig. 1. Shell, A. cygnea, fig. 1, *a*, 1, *b*.

Two undoubted species of *Anodonta* are found in the fresh waters of Europe, besides numerous disputed species; a few only are African in their geographical range; nine or ten are inhabitants of the rivers of Asia; one only is from New Holland; while the remainder, in nearly equal proportions, are from the rivers and lakes of North and South America.

Species of Anodonta.

argentea, *Lea.*
Arkansensis, *Lea.*
atrovirens, *Phil.*
cognata, *Gould.*
cornea, *Phil.*
Couperiana, *Lea.*
crepera, *Lea.*
Cumingii, *Lea.*
cygnea, *Linn.*
decora, *Lea.*
denigrata, *Lea.*
Dupuyi, *Ray and Drouet.*
edentula, *Say.*
feminalis, *Gould.*
ferruginea, *Lea.*
Férussaciana, *Lea.*
fluviatilis, *Lea.*
Footiana, *Lea.*
fragilis, *Lam.*
Giullaini, *Recluz.*
gibbosa, *Say.*
gigantea, *Lea.*
glauca, *Valenc.*
globosa, *Lea.*
grandis, *Say.*
Harpethensis, *Lea.*
Housatonica, *Linsl.*
imbecilis, *Say.*
implicata, *Say.*
limnoica, *D'Orb.*
Linnæana, *Lea.*
Middendorffii, *Siem.*
Milleti, *Ray and Drouet.*
Mortoniana, *Lea.*
Nicaraguæ, *Phil.*
oblita, *Lea.*

opaca, *Lea.*
Oregonensis, *Lea.*
ovata, *Lea.*
pavonia, *Lea.*
penicillata, *Gray.*
Pensylvanica, *Lam.*
Pepiniana, *Lea.*
plana, *Lea.*
Puelchana, *D'Orb.*
purpurea, *Valenc.*
salmonia, *Lea.*
Schæfferiana, *Lea.*
Sedakowii, *Siem.*
Stewartiana, *Lea.*
subcrassa, *Lea.*
suborbiculata, *Say.*
subvexa, *Conr.*
sulcosa, *Conr.*
tetragona, *Lea.*
trigona, *Spix.*
Troutwiniana, *Lea.*
undulata, *Say.*
uniopsis, *Lam.*
virens, *Lea.*
viridis, *Lea.*
Wardiana, *Lea.*

Sub-gen. SYMPHYNOTA, Lea.

Shell symphynote or with the hinge-margin winged, trigonal or ovate; surface of valves smooth or plicate.

Benedictensis, *Lea.*
Californiensis, *Lea.*
crispata, *Lam.*
magnifica, *Lea.*
Nuttalliana, *Lea.*
tortilis, *Lea*
Wahlamatensis, *Lea.*
Woodiana, *Lea.*

Sub-gen. LAMPROSCAPHA, Swainson.

Shell not winged, elongate, pod-shaped; beaks near the anterior extremity. Teeth none.

arcuata, *Férus.*
Buchanensis, *Lea.*
cylindracea, *Lea.*
elongata, *Swains.*
ensiformis, *Spix.*
exilis, *Lea.*
gracilis, *Lea.*
lucida, *D'Orb.*
Maryattana, *Lea.*
Schröteriana, *Lea.*
sinuosa, *Lam.*
soleniformis, *D'Orb.*
solidula, *Dev. and Hup.*
subcylindracea, *Lea.*
tenebricosa, *Lea.*
tenuis, *Lea.*
Wheatleyi, *Lea.*

Sub-gen. PATULARIA, Swainson (Glabaris, *Gray*).

Shell nearly equilateral, round or cordate. Hinge edentulous.

angulata, *Lea*.
anserina, *Spix*.
crassa, *Swains*.
Georginæ, *Gray*.
latomarginata, *Lea*.
Montezuma, *Lea*.
obtusa, *Spix*.
Patagonica, *Lam*.
polita, *Mouss*.
porcifera, *Gray*.
sirionos, *D'Orb*.
Spixii, *D'Orb*.
trapezialis, *Lam*.

Sub-fam. MYCETOPINÆ.

Labial palps longer than wide. Mantle-lobes disunited as far as the anal aperture, which is closed; siphonal tubes none; outer branchiæ entirely united or grown together. Foot very long, cylindrical, produced and widened into a knob at the extremity.

Shell thin, gaping at both sides; beaks nearly central. Hinge linear, straight, toothless.

Genus MYCETOPUS, D'Orbigny.

Shell thin, transverse, elongately cylindrical, sub-arcuate, equivalve, sub-equilateral, gaping at both ends, especially posteriorly, covered with an olivaceous epidermis, bluish internally; beaks central, bi-angulated, incurved. Hinge linear, straight, edentulous; ligament thin, marginal. Muscular impressions somewhat indistinct, composite.

Ex. M. siliquosus, *D'Orbigny*, pl. 118, fig. 2. Shell, M. soleniformis, *D'Orbigny*, fig. 2, *a*, 2, *b*.

The species of *Mycetopus* inhabit the rivers of South America. The shells somewhat resemble those of *Anodonta*, but the valves are sub-equilateral, and gape at the sides.

Species of Mycetopus.

siliquosus, *D'Orb.* ventricosus, *D'Orb.*
soleniformis, *D'Orb.*

Fam. MUTELIDÆ.

Mouth and lips small; labial palps very large, oval, attached by their straight edges, without any free points as in *Unionidæ*. Mantle-lobes united posteriorly, and prolonged into two short, unequal, siphonal tubes; gills large, nearly equal, united to the body. Foot, large, thick, compressed, tongue-shaped, angular in front.

Shell equivalve, oblong, covered with a hard, polished epidermis; beaks small, turned to one side, and nearly straight. Hinge large, linear, toothless, tubercular or crenate; ligament external, marginal. Muscular impressions two, separate, lateral.

Fluviatile.

Genus MUTELA, Scopoli.

Outer gill united to the mantle as far as its extremity; inner gill entirely united to the foot.

Shell equivalve, inequilateral, transverse, pearly within; beaks small, recurved, nearly straight. Hinge long, linear, attenuated towards the middle, tuberculose along its length; ligament external, marginal. Pallial impression simple.

Syn. Mutel, *Adans.* Scapha, *Humph.*, not *Gray.*

Anodontites, *Brug.* Iridina, *Lam.* Berpolis, ***Leach.*** Euphira, *Gistel.* Platiris, part, *Lea.*

Ex. M. dubia, *Gmelin*, pl. 119, fig. 1, 1, *a.*

The species of *Mutela* are few in number, and are African in their geographical distribution.

Species of Mutela.

dubia, *Gmel.* valeus, *Parr.*

Sub-gen. CALLISCAPHA, Swainson.

Shell with the hinge-margin only slightly crenulated at the umbones.

cœlestis, *Lea.* Nilotica, *Férus. and Sow.*

Genus PLEIODON, Conrad.

Shell elongate-ovate, strong, convex, ventral edge much arcuated, sides rounded, the anterior the broader and longer; valves covered with a dark, olive epidermis; beaks usually eroded. Hinge-margin sub-arcuated, becoming broad at the extremities, furnished with large, tubercular crenations.

Ex. P. ovatus, *Swainson*, pl. 119, fig. 2, 2, *a.*

The interior of the valves in this genus is covered with an iridescent, silvery nacre, often tinged with pink. Two species only are known, from Africa.

Species of Pleiodon.

Leaii, *Sow.* ovatus, *Swains*

Genus SPATHA, Lea.

Outer gill united to the mantle as far as its extremity; inner gill not united to the foot.

Shell rounded, ovate, thick, covered with a reddish-brown epidermis. Hinge-margin arcuated, smooth.

Ex. S. rubens, *Lamarck*, pl. 119, fig. 3, 3, *a*.

The species of *Spatha* are from Senegal and the river Nile.

Species of Spatha.

Chaiziana, *Rang.*
rubens, *Lam.*
Wahlbergi, *Krauss.*

Genus LEILA, Gray.

Shell ovate, inflated, very inequilateral, wide posteriorly, gaping at the margins, pearly within; beaks somewhat prominent. Hinge-margin straight, simple. Pallial sinus broad, and much incurved.

Syn. Columba, *Lea*, not *Linn.*

Ex. L. Blainvilliana, *Lea*, pl. 119, fig. 4, 4, *a*.

The few species of this genus described are from South America.

Species of Leila.

Blainvilliana, *Lea.*
esula, *Crist. and Jan.*
Parishii, *Gray.*

Genus TRIQUETRA, Klein.

Outer gill united to the mantle as far as its extremity; inner gill united to the foot.

Shell equivalve, obliquely triangular, auriculate, the dorsal edge truncated and straight. Hinge with two little elevated teeth; the posterior or cardinal tooth divided into numerous diverging portions (the inner portions being the smaller); the anterior or lateral tooth very elongated and lamellar; ligament external and linear.

Syn. Prisodon, *Schum.* Hyria, *Lam.* Paxyodon, *Schum.* Hyriopsis, *Conr.* Triplodon, *Spix.*

Ex. T. subviridis, *Klein.* pl. 120, fig. 1, 1, *a.*

All the species of this genus known, are from the rivers of South America.

Species of Triquetra.

Browniana, *Lea.*	elongata, *Swains.*
corrugata, *Lam.*	subviridis, *Klein.*

Genus CASTALIA, Lamarck.

Branchial aperture surrounded with cirrhi, anal aperture smooth; outer gill united to the mantle as far as its extremity.

Shell equivalve, inequilateral, trigonal; beaks decorticated, anteriorly recurved. Hinge with two lamellar, transversely-striated teeth; one posterior, remote, abbreviated, and somewhat tri-lamellar; the other anterior, elongated, and lateral; ligament external.

Syn. Prisodon, *β. Schum.* Tetraplodon, *Spix.*

Ex. C. cordata, *Humphrey*, pl. 120, fig. 2, 2, *a*.

The three undisputed species we have given, are from the rivers of South America; many others have been described, but are only considered varieties.

Species of Castalia.

cordata, *Humph.*
Duprei, *Reclus.*
nodulosa, *Wood.*

Fam. ÆTHERIIDÆ.

Animal with the body large, thick, oblong, projecting backwards into the mantle-cavity. Labial palps very large, semi-oval, attached by the straight side, without any free points. Mantle-lobes bearded, disunited in their entire length; gills two on each side, unequal, dependent, united behind and to the body and mantle. Foot none.

Shell, when young, regular and free; when adult, irregular, attached by the surface of one valve; valves covered with a thick, olivaceous epidermis, pearly within. Hinge without teeth; ligament sub-internal. Muscular scars two, the anterior small and linear (united in the adult state in *Mülleria*).

Fluviatile.

Genus ÆTHERIA, Lamarck.

Shell irregular, inequivalve, adherent by the beak and by tubular prolongations of one of the valves; surface of valves foliaceous, covered with a thick, olivaceous epidermis; pearly within, the nacre vesicular or appearing as if blistered. Hinge-margin curved, toothless; ligament external, tortuous, partially sunk in a groove of the area

of the left or attached valve. Muscular scars two, wide apart, oblong, the anterior very long and irregular; pallial impression simple.

Ex. Æ. semilunata, *Lamarck*, pl. 120, fig. 3, 3, *a*.

The visceral mass of the body in these animals is protruded backwards into the cavity of the mantle, and has been described by M. Rang as the foot. There is, however, no distinct muscular foot in the adult animal, although, as Dr. Gray observes, the foot may be present in the young state before the shell is attached. Being adherent to each other and to foreign bodies, a locomotive organ or foot would indeed be superfluous to the animals, except in their young state, when they are free. Of this genus, one species, *Ætheria Stefanensis*, is met with in the river Amazon; the others are from the great rivers of Africa, being found in the river Senegal, and in the Nile above the cataracts; these latter are the "fresh-water oysters" mentioned by the traveller Bruce, which are collected as articles of food by the inhabitants, who also employ their iridescent valves in ornamenting their tombs.

Species of Ætheria.

Cailliaudi, *Férus.*
elliptica, *Lam.*
semilunata, *Lam.*
Stefanensis, *Moric.*

Genus MÜLLERIA, Férussac.

Shell in the adult state irrregular, inequivalve, covered with a thick epidermis, and attached by the right valve; beaks elongated, gradually produced and thickened with age in front of the fixed valve; interior of the valves nacreous. Ligament in a marginal groove. Adductor scars united,

forming a single, posterior muscular impression. In the young and free state shell equivalve, shaped like *Anodon*, with two distinct muscular scars, and an external, conspicuous, elongated ligament.

Syn. Acostæa, *D'Orbigny*.

Ex. M. lobata, *Férussac*, pl. 120, fig, 4, 4, *a*, 4, *b*.

The *Acostæa Guaduasana*, from the river Magdalena, near Bogota, is the same as the *Mülleria lobata* described by Férussac and Sowerby, and presents a curious example of being dimyary and locomotive when young, and monomyary and fixed when in the adult condition.

Fam. MYTILIDÆ.

Labial palps elongate, pointed, free. Mantle-margins free, or united behind to form a more or less complete anal tube; gills two on each side, nearly equal, elongated, dependent, united behind to each other and to the mantle. Foot narrow, strap-shaped, furnished with a byssal groove.

Shell elongated, equivalve, closed; surface of valves covered with a dark, thick epidermis, more or less pearly within. Hinge edentulous, or sub-dentate; ligament subinternal, marginal, linear. Anterior muscular impression small and narrow, the hinder large and obscure.

Marine, byssiferous.

Sub-fam. MYTILINÆ.

Hinder part of mantle only slightly produced; anterior adductor muscle small.

Genus MYTILUS, Linnæus.

Mantle freely open; ventral margin simple; branchial furnished with pinnated fringes; anal opening plain and sessile.

Shell equivalve, very inequilateral, sub-triangular, more or less tumid, rounded behind; surface of valves covered with an epidermis; beaks almost straight, terminal, pointed. Hinge without teeth; ligament linear, marginal, sub-internal. Muscular impressions two, unequal; pallial impression obscure, simple. Byssus strong and coarse.

Syn. Mytulus. Musculus, *Rondelet.* Callitriche, Callitrichoderma, *Poli.* Perna, *Schum.*, *Retz.*, not *Adans.* Chloromya, *Mörch.*

Ex. M. edulis, *Linnæus*, pl. 121, fig. 1. Shell, M. edulis, fig. 1, *a*, 1, *b*.

The genus *Mytilus* includes many species, which are world-wide in their distribution, being found in Behring's Straits and the Black Sea, at Cape Horn, the Cape of Good Hope, and New Zealand. They are usually found attached by a byssus either to stones or floating bodies. The ligulate, grooved foot has the power of spinning the silky material of the byssus when the animal requires temporarily to anchor itself. They produce small and inferior pearls, and the animals are used as bait in deep-sea fisheries.

Species of Mytilus.

achatinus, *Lam.*
Africanus, *Chem.*
albus, *Siem.*
angustanus, *Lam.*

angustus, *Phil.*
biceps, *Mke.*
borealis, *Lam.*
canalis, *Lam.*
Chiloënsis, *Phil.*
cochlear, *Mke.*
compressus, *Phil.*
confusus, *Chem.*
corneus, *Lam.*
decussatus, *Lam.*
edulis, *Linn.*
exaratus, *Phil.*
exilis, *Phil.*
Grayanus, *Dkr.*
Grunerianus, *Dkr.*
horridus, *Dkr.*
lacunatus, *Lam.*
latus, *Lam.*
lineatus, *Gmel.*
minimus, *Poli.*
nitens, *Mke.*
obesus, *Dkr.*
obscurus, *Dkr.*
palliopunctatus, *Dkr.*
perna, *Linn.*
planulatus, *Lam.*
robustus, *Migh.*
Senegalensis, *Lam.*
sinuatus, *Dkr.*
smaragdinus, *Chem.*
subdistortus, *Recluz.*
tortus, *Dkr.*
trossulus, *Gould.*
ungulatus, *Linn.*
variabilis, *Krauss.*
violaceus, *Lam.*
viridis, *Linn.*
zonarius, *Lam.*

Sub-gen. AULACOMYA, Mörch (Hormomya, *Mörch*).

Shell with the valves radiately sulcated.

Adamsianus, *Dkr.*
arealis, *Mke.*
atropurpureus, *Dkr.*
Californianus, *Conr.*
Charpentieri, *Dkr.*
curvatus, *Dkr.*
divaricatus, *Gould.*
erosus, *Lam.*
exustus, *Linn.*
granulatus, *Hanl.*
hamatus, *Say.*
hirsutus, *Lam.*
Lavalleanus, *D'Orb.*
Magellanicus, *Chem.*
Menkeanus, *Phil.*
Morrisii, *Dkr.*
niger, *Gmel.*
ovalis, *Lam.*
polyodontus, *Quoy.*
puniceus, *Gmel.*
rostratus, *Dkr.*
strigatus, *Hanl.*
tenuistriatus, *Dkr.*
ustulatus, *Lam.*

Genus MYRINA, H. and A. Adams.

Shell transverse, oblong, sub-equilateral; valves closed, covered with a brown, horny epidermis, pearly within; beaks sub-central. Hinge edentulous; ligament internal, linear. Muscular impressions far apart; pallial line simple. Byssiferous.

Ex. M. pelagica, *Forbes*, pl. 121, fig. 2. Shell, M. pelagica, fig. 2, *a*, 2, *b*.

The shell on which we have established this genus was found off the Cape of Good Hope attached to floating masses of blubber.

Sub-fam. CRENELLINÆ.

Hinder part of mantle produced, forming false siphons.

Genus CRENELLA, Brown.

Mantle closed anteriorly; anal tube perfect and produced.

Shell equivalve, sub-orbicular or oblong, tumid or compressed; surface of valves covered with an epidermis, and either entirely or partially ornamented with striæ radiating usually in two diverging fasciculi from the beaks. Hinge-margin toothless, generally crenulated; ligament linear, internal. Muscular scars two, unequal; pallial impression obscure.

Syn. Myaparo, *Lea*. Stalagmium, *Conrad*. Nuculocardia, *D'Orb*.

Ex. C. discors, *Linnæus*, pl. 121, fig. 3. Shell, C. decussata, *Linnæus*, fig. 3, *a*, 3, *b*.

The species of this genus are most numerous in the temperate and Arctic seas, several being found on the shores of Britain, and others in Nova Zembla and Ochotsk, while a few have been observed in New Zealand. They range from low-water to forty fathoms. Some of the species are found imbedded in the mantle of Ascidians, as *C. marmorata*, and others have been observed to spin a sort of nest, or are found concealing themselves among the roots of sea-weed and corallines. Fossil species have been detected in the Upper Green-sand of Europe.

Species of Crenella.

bulla, *Dkr.*
decussata, *Mont.*
divaricata, *D'Orb.*
glandula, *Totten.*
rhombea, *Berkl.*

Sub-gen. MODIOLARIA, Beck (Lanistes, *Swains.*, not *Montf.* Lanistina, *Gray*).

Shell oblong, the radiating striæ obsolete in the middle.

Chenuana, *Recluz.*
coarctata, *Dkr.*
concinna, *Dkr.*
cor, *Martyn.*
costulata, *Risso.*
cultellus, *Desh.*
Cumingiana, *Dkr.*
discors, *Linn.*
faba, *O. Fabr.*
lævigata, *Gray.*
marmorata, *Forbes.*
nana, *Dkr.*
nexa, *Gould.*
nigra, *Gray.*
pectinula, *Gould.*
pusilla, *Gould.*
strigata, *Hanl.*
verrucosa, *Midd.*

Genus PERNA, Adanson.

Margins of mantle simple, open; anal tube short, more or less perfect.

Shell oblong, equivalve, inequilateral; surface of valves smooth, concentrically striated, or radiately sulcated, invested with an epidermis often filamentose; anterior side very short; beaks nearly lateral, depressed on the short side. Hinge-margin toothless, or with only a compressed tooth-like callus, and rarely corrugated; ligament linear, almost internal, placed in a marginal canal. Muscular scars very unequal; pallial impression obscure.

Syn. Volsella, *Scopoli.* Pholas, *Klein*, not *Linn.* Tamarindiformis (*b*), *Gevers.* Modiola, *Lam.* Modiolus, *Risso.*

Ex. P. Americana, *D'Herbigny*, pl. 121, fig. 4. Shell, P. modiolus, *Linnæus*, fig. 4, *a*, 4, *b*.

The *Pernæ* or *Modiolæ* are distinguished from the *Mytili* by their habit of burrowing or spinning a sort of woven nest of stones and fragment of shells, in which they occasionally conceal themselves. There are upwards of seventy species, chiefly tropical in their geographical distribution, though a few have been observed in Britain, and in the Mediterranean and Arctic seas. Numerous fossil species are obtained from the Lias in Europe, India, and the United States.

Species of Perna.

aberrans, *C. B. Adams.*
abyssicola, *C. B. Adams.*
Adriatica, *Lam.*
albicosta, *Lam.*
Americana, *D'Herb.*
Antillarum, *Phil.*
arata, *Dkr.*
arborescens, *Chem.*
arcuatula, *Hanl.*
areola, *Gould.*
auriculata, *Krauss.*
australis, *Gray.*
Ballii, *Brown.*
barbata, *Linn.*
biradiata, *Hanl.*
Brasiliensis, *Chem.*
Californianus, *Eschsch.*
capax, *Conr.*

Cecillii, *Phil.*
corrugata, *Stimp.*
elegans, *Gray.*
elongata, *Swains.*
ferruginosa, *Phil.*
flabellata, *Gould.*
flavida, *Dkr.*
Fortunei, *Dkr.*
glaberrima, *Dkr.*
gracilis, *Phil.*
grandis, *Phil.*
gubernaculum, *Dkr.*
hepatica, *Gould.*
inconstans, *Dkr.*
Japonica, *Dkr.*
Malayana, *Phil.*
Metcalfei, *Hanl.*
microptera, *Desh.*
modiolus, *Linn.*
modulaides, *Bolt.*
nitida, *Hanl.*
Patagonica, *D'Orb.*
perfragilis, *Dkr.*
phaseolina, *Phil.*
Philippinarum, *Hanl.*
picta, *Dkr.*
plicata, *Gmel.*
recta, *Conr.*
rhomboidea, *Hanl.*
Rumphii, *Phil.*
securis, *Lam.*
semifusca, *Lam.*
Senhousia, *Bens.*
siliqua, *Phil.*
sordida, *Hanl.*
speciosa, *Dkr.*
splendens, *Dkr.*
strigata, *Hanl.*
subpurpurea, *Dkr.*
triangulum, *Koch.*
tristis, *Dkr.*
umbilicata, *Penn.*
undulata, *Dkr.*

Sub-gen. BRACHYDONTES, Swainson.

Shell with the valves radiately sulcated; hinge-margin forming an angle with the anterior slope and crenulated.

crebristriata, *Conr.*
crenulata, *Dkr.*
emarginata, *Bens.*
Magellanica, *Dkr.*
modiolus, *Linn.*
Petagnai, *Scaech.*
plicatula, *Lam.*
purpurata, *Lam.*
setigera, *Dkr.*
striatula, *Hanl.*
subramosa, *Hnl.*
subsulcata, *Dkr.*

Sub-gen. ADULA, H. and A. Adams.

Shell elongate, cylindrical, posterior side obliquely truncate; beaks sub-central.

soleniformis, *D'Orb.*

Sub-fam. LITHOPHAGINÆ.

Hinder part of mantle more or less produced; anterior adductor muscle moderate.

Genus LITHOPHAGA, Bolten.

Shell transverse, cylindrically oblong, equivalve, extremities rounded, the anterior exceedingly short; surface of valves covered with a brown, horny epidermis; beaks slightly prominent. Hinge linear, edentulous; ligament marginal, chiefly internal. Muscular impression, compound, indistinct.

Syn. Tamarindiformis (*a*), *Gevers.* Lithophagus, *Mühlf.* Perna, *Oken,* not *Adans.* Lithodomus, *Cuvier.*

Ex. L. lithoglypha, *Meuschen,* pl. 121, fig. 5. Shell, L. dactylus, *Sowerby,* fig. 5, *a*, 5, *b*.

Cuvier says that the *Lithophagæ* in the young state suspend themselves to rocks by a byssus; when adult they form cavities shaped like the shells in rocks, or in other shells. *L. dactylus* is an article of diet in the Mediterranean, being eagerly collected by the fishermen and sold as a luxury in the markets. The species are somewhat numerous, and are inhabitants chiefly of the West Indian Islands and of New Zealand. Dr. Carpenter says that the outer shell-layer has a tubular structure, the tubes being excessively minute, seldom branching, and oblique and parallel.

Species of Lithophaga.

appendiculata, *Phil.*
aristata, *Soland.*
attenuata, *Desh.*
bisulcata, *D'Orb.*
calyculata, *Cpr.*
canalifera, *Hanl.*
caperata, *Phil.*
Caribæa, *Phil.*

castanea, *Dkr.*
caudigera, *Lam.*
coarctata, *Dkr.*
coralliophaga, *Chem.*
crenulata, *Dkr.*
crispata, *Phil.*
Cumingiana, *Dkr.*
cylindrica, *Krauss.*
dactylus, *Sow.*
divaricata, *Phil.*
gracilis, *Phil.*
Gruneri, *Phil.*
Hanleyana, *Dkr.*
lævigata, *Quoy.*
lanigera, *Dkr.*
lithoglypha, *Meusch.*
nasuta, *Phil.*
nigra, *D'Orb.*
obesa, *Phil.*
opifex, *Say.*
Philippiana, *Dkr.*
plumula, *Hanl.*
pulex, *Lam.*
rugifera, *Dkr.*
silicula, *Lam.*
straminea, *Dkr.*
teres, *Phil.*
tunicata, *Gray.*
ventrosa, *Dkr.*

Sub-gen. LEIOSOLENUS, Carpenter.

The cavity or burrow formed by the animal with the aperture prolonged into a tube, more or less bilobed at the outer end, contracted at the junction.

spatiosa, *Cpr.*

Sub-gen. BOTULA, Mörch.

Shell sub-rhombic-oblong, sub-cylindraceous; anterior extremity much rounded, posterior end very obtuse; beaks very wide, touching, and sub-terminal.

arenaria, *Meusch.*
fusca, *Gmel.*
splendida, *Dkr.*
vestita, *Phil.*

Fam. MODIOLARCIDÆ.

Palpi obsolete. Mantle-lobes united; siphonal apertures two, distinct, the interspaces with two rows of cirrhi; branchial opening large, inferior, with a fringed border;

anal opening moderate, plain; pedal aperture small, basal, sub-anterior. Gills four, thick, dependent, sub-trigonal, truncated in front, narrow, produced and united behind. Foot with a small flat sole crenulated at the edge, deeply grooved behind, and byssiferous.

Shell equivalve, covered with a hard, polished epidermis. Hinge-teeth none, or rudimentary; cartilage linear, external.

Living attached to floating sea-weeds.

Genus MODIOLARCA, Gray.

Shell ovate, trapezoidal, thin, fragile, ventricose; surface of valves covered with a smooth, shining epidermis; beaks anterior, prominent, contiguous; anterior end compressed, sloping abruptly to the base; hind margin rounded, ventral margin somewhat sinuous and gaping anteriorly. Hinge with two small, oblique teeth in the right valve, which receive two corresponding ones of the left. Muscular impressions distinct; pallial sigmoid.

Syn. Phascolicama, *Valenc.* Gaimardia, *Gould.*

Ex. M. trapezina, *Lamarck*, pl. 122, fig. 1, 1, *a*.

The genus *Modiolarca* resembles the Palæozoic *Modiolopsis* in the large size of the anterior adductor impression. *M. trapezina* is found attached by its byssus to floating sea-weed in many parts of the Southern Ocean, as at the Falkland Islands, and off Kerguelin; and *M. subtorta* on the north coast of New Holland.

Species of Modiolarca.

subtorta, *Dkr* trapezina, *Lam.*

Fam. DREISSENIDÆ.

Animal oblong. Mantle closed, except a passage for the foot and the two siphonal orifices; branchial opening prolonged into a tube with a circular, fringed orifice; anal opening plain and sub-sessile. Foot short, ligulate, with a conspicuous byssal groove.

Living in fresh water; byssiferous.

In the *Dreissenidæ* the microscopic structure of the shell, as shown by Dr. Carpenter, is very different from that of the *Mytilidæ*, the internal layer being composed of large prismatic cells, with a layer of brownish colour under the epidermis which also shows traces of a cellular structure.

Genus DREISSENA, Van Beneden.

Shell equivalve, very inequilateral, sub-triangular, tumid; surface of valves covered with an epidermis; beaks terminal, furnished internally with a transverse shelf or septum. Hinge composed of an imperfectly-developed cardinal tooth in the right valve, with a corresponding socket in the left; ligament linear, internal. Three muscular impressions; pallial impression obscure.

Syn. Mytilina, *Cantr.* Tichogonia, *Rossm.* Cælogonia, *Bronn.* Dithalmia, *Say.* Enocephalus, *Münst.* (foss.) Congeria, *Partsch.* (foss.) Mytilina, Mytilomya, *Cantr.* (foss.) ? Myoconcha, *D'Orb.*

Ex. D. polymorpha, *Pallas*, pl. 122, fig. 2. Shell, D. polymorpha, fig. 2, *a*, 2, *b*.

The type of this genus, *Mytilus polymorphus* of Pallas,

an inhabitant of the Caspian and Black seas, at the mouths of rivers, has become naturalised in many of the docks and canals throughout England. There are about fourteen fossil species known, from the Eocene of Britain and Germany.

Species of Dreissena.

carinata, *Dkr.*
Cumingiana, *Dkr.*
polymorpha, *Pallas.*
strigata, *Hinds.*

Sub-gen. PRAXIS, H. and A. Adams.

Shell with a small lamina affixed to the septum.

Africana, *Van Ben.*
Americana, *Recluz.*
cochleata, *Kickx.*
Domingensis, *Recluz.*
Kusteri, *Dkr.*
Gundlachii, *Dkr.*
Mörchiana, *Dkr.*
Pfeifferi, *Dkr.*
Rossmaessleri, *Dkr.*
Rüsei, *Dkr.*
Sallei, *Recluz.*

Genus SEPTIFER, Recluz.

Shell equivalve, very inequilateral; ventral margin concave and emarginate for the byssus; surface of valves covered with an epidermis; beaks terminal, sub-inflexed. Hinge without teeth, furnished with a lamellar septum placed vertically under the beaks; ligamentiferous fossulæ linear, marginal, dorsal, and vertical, with a sub-spongy cretaceous body between the margins. Muscular impressions superficial, the anterior small, rounded, the posterior reniform; pallial impression straight, without any sinus.

Syn. Septiger, *Mörch.*

Ex. S. bilocularis, *Linnæus*, pl. 122, fig. 3, 3, *a*.

In the shells of this genus, which are found at the Mauritius and in Australia, there is an umbonal shelf for the support of the anterior adductor muscle, as in *Dreissena*.

Species of Septifer.

bilocularis, *Linn.*
crassus, *Dkr.*
Cumingii, *Recluz.*
excisus, *Wiegm.*
Forskälii, *Dkr.*
furcatus, *Dkr.*
Grayanus, *Dkr.*
Herrmannseni, *Dkr.*
Kraussii, *Küst.*
Troschelii, *Dkr.*
virgatus, *Wiegm.*

Fam. VULSELLIDÆ.

Anterior adductor muscle none. Gills narrow, much produced behind, united together and to the inner surface of the mantle, dividing the mantle-cavity into two parts. Rectum simple; vent free, medial.

Genus VULSELLA, Humphrey.

Shell longitudinal, sub-equivalve, irregular; beaks equal. Hinge with a prominent cardinal callus, depressed above, in each valve, furnished with a conical, obliquely-arcuated pit for the ligament.

Syn. Reniella, *Swainson* (young).

Ex. V. lingulata, *Linnæus*, pl. 122, fig. 4, 4, *a*.

The species of this genus are inhabitants of the Australian seas, the Indian Ocean, and the Red Sea, and are usually found imbedded in sponges. Extinct examples have been discovered in the Upper Chalk of Britain and France.

Species of Vulsella.

hians, *Lam.*
lingulata, *Linn.*
minor, *Chem.*
mytilina, *Lam.*
ovata, *Lam.*
rugosa, *Lam.*
spongiarum, *Lam.*

Fam. AVICULIDÆ.

Mantle freely open, margins cirrhated; no siphons. Palps large. Foot small, cylindric, furnished with a byssal groove. Adductor muscles very unequal, one being much larger than the rest.

Shell sub-inequivalve, foliated, pearly within, composed of prismatic cellular substance, and the interior of true nacre. Ligament marginal, sub-linear, either interrupted by indentations or serial teeth, or wholly simple.

Genus AVICULA, Klein.

Shell oblique, inequivalve, fragile, rather smooth; right valve most convex; a sinus in the left for the passage of the byssus. Hinge-line straight, the extremities produced, the anterior caudiform or beaked; a single cardinal tooth in each valve under the beaks. Ligament partially external, linear. Pallial impression entire; muscular scars two or more, one very large, the others small.

Syn. Pteria, *Scopoli.* Anonica, *Oken.* Glaucus, *Poli.*

Ex. A. hirundo, *Linnæus*, pl. 122, fig. 5. Shell, A. hirundo, fig. 5, *a*, 5, *b*.

The hinge-margin in these shells is usually prolonged into unequal, wing-like ears, and the epidermis is often produced at the margin of the valves into a fringe. The pearly nacre does not extend to the ventral edge of the valves, and the byssus is often cylindrical and solidified. The species are inhabitants of the British Islands, the Mediterranean and Red seas, the Indian and Pacific oceans, and the coasts of South America.

Species of Avicula.

brevicauda, *Desh.*
costellata, *Lam.*
crocea, *Chem.*
Georgina, *Quoy.*
heteroptera, *Lam.*
hirundo, *Linn.*
Largillierti, *Phil.*
lingulata, *Desh.*
livida, *Desh.*
macroptera, *Lam.*
marmorata, *Phil.*
meleagridis, *Chem.*
morio, *Leach.*
physoides, *Lam.*
pica, *Phil.*
rufa, *Dkr.*
Savignyi, *Desh.*
semisagitta, *Lam.*
serrulata, *Dkr.*
sterna, *Gould.*
tortirostris, *Dkr.*
vespertilio, *Desh.*
virens, *Lam.*

Genus MARGARITIFERA, Browne.

Shell orbicular or sub-quadrate, sub-equivalve; surface of valves squamose, pearly within, not eared or winged posteriorly; right valve with a byssal sinus. Hinge linear, edentulous; ligament marginal, elongated, nearly external, dilated in the middle. Posterior muscular scar large and sub-central.

Syn. Margaritophora, *Mühlf.* Unionium, *Link.* Pinc-

tada, *Bolt.* Perlamater, *Schum.* Meleagrina, *Lam.* Margarita, *Leach.*

Ex. M. margaritifera, *Linnæus*, pl. 122, fig. 6, 6, *a*.

The principal difference between the "Pearl Oysters" and the *Aviculæ*, consists in the more orbicular form and the equality of the valves. The inner layer of the shells is employed in the manufacture of various objects and for the purpose of inlaying under the name of "mother-o'-pearl." The pearls of commerce, which are detached portions of the nacre of the interior, are also obtained from various species of this genus. The pearl fisheries of Ceylon and the Persian Gulf are the most famous. The shells are procured from about twelve fathoms water.

Species of Margaritifera.

albina, *Lam.*
aluco, *Phil.*
Chemnitzii, *Phil.*
fimbriata, *Dkr.*
foliacea, *Bolt.*
fucata, *Gould.*
glabra, *Gould.*
imbricata, *Bolt.*
inflata, *Schum.*
laticauda, *Phil.*
lurida, *Gould.*
maculata, *Gould.*
margaritifera, *Linn.*
Mazatlanica, *Hanl.*
nigra, *Gould.*
psittacea, *Phil.*
radiata, *Leach.*
semiaurata, *Linn.*
strix, *Phil.*
vidua, *Gould.*

Genus ISOGNOMON, Klein.

Shell nearly equivalve, compressed; surface of valves lamellar; right valve with a byssal sinus. Hinge linear, the area wide, with numerous transverse, elongated cartilage-pits. Muscular impression large, sub-central, double.

Syn. Melina, *Retzius.* Pedalion, *Solander.* Sutura,

Mühlf. Hippochæta, *Sangiov.* Isogonum, *Bolten.* Perna, *Brug.*, not *Adans.*

Ex. I. ephippium, *Linnæus*, pl. 123, fig. 1, 1, *a.*

These animals are usually found attached by their byssus to rocks in rather deep water. They are inhabitants of tropical seas only, being found in the East Indies, the Cape de Verds, and Western America. Fossil species have been detected in the Trias of Europe, Chili, and the United States; in some of these the posterior side is greatly produced and wing-like.

Species of Isognomon.

alatus, *Gmel.*
argillaceus, *Gould.*
avicularis, *Lam.*
Chemnitzianus, *D'Orb.*
costellatus, *Conr.*
crenatus, *Gould.*
dentiferus, *Krauss.*
ephippium, *Linn.*
eremita, *Gould.*
Janus, *Cpr.*
norma, *Bolt.*
legumen, *Gmel.*
marsupium, *Lam.*
nana, *Gould.*
nucleus, *Lam.*
perna, *Linn.*
torva, *Gould.*
vulsella, *Lam.*

Genus MALLEUS, Lamarck.

Shell sub-equivalve, irregular, greatly elongated at the base; beaks small, diverging, central. Hinge straight, eared on each side, without teeth, with an elongated, conical cartilage-pit under the beaks; ligament partly external, short.

Syn. Himantopoda, *Schum.* Tudes, *Oken.*

Ex. M. vulgaris, *Lamarck*, pl. 123, fig. 2, 2, *a.*

In this genus the pearly lining of the valves does not extend as far as the ventral margin in the adult; the young

shells are like *Aviculæ*, but during the growth of the animal layers are developed from the edge of the valves until the shell assumes the peculiar elongated form from which it derives its familiar name of the "Hammer Oyster." The species are found in the Indian and Chinese seas.

Species of Malleus.

albus, *Chem.*
decurtatus, *Lam.*
figuratus, *Chem.*
normalis, *Lam.*
regula, *Forsk.*
vulgaris, *Lam.*

Genus CRENATULA, Lamarck.

Shell equivalve, thin, oblong, compressed, lamellated, rather irregular; byssal sinus obsolete. Hinge lateral, linear, marginal, with numerous shallow, crescent-shaped cartilage-pits.

Syn. Dalacia, *Gray.*

Ex. C. semiaurata, *Gmelin*, pl. 123, fig. 3, 3, *a*.

The species of *Crenatula* appear to want the usual byssus seen in genera of this family, and to take up their abode in sponges. They are found in the seas of India, Australia, North Africa, China, and in the Red Sea.

Species of Crenatula.

bicostalis, *Lam.*
modiolaris, *Lam.*
mytiloides, *Lam.*
nigrina, *Lam.*
pergaminea, *Gould.*
picta, *Gmel.*
semiaurata, *Gmel.*
viridis, *Lam.*

Genus PINNA, Linnæus.

Mouth with foliaceous lips. Anus with a long, ligulate valve.

Shell very oblique, wedge-shaped, triangular, equivalve, exceedingly inequilateral, more or less thin and fragile, gaping posteriorly; surface of valves smooth, or scaly, or obliquely furrowed, the apical portions sometimes longitudinally fissured, the fissure filled with a cartilage; beaks terminal. Hinge straight, long, toothless; ligament linear, internal. Pallial impression entire; muscular impressions very unequal.

Syn. Chimæra, *Poli.* Pennaria, *Browne.* Cyrtopinna, *Mörch.*

Ex. P. nobilis, *Linnæus*, pl. 123, fig. 4, 4, *a*.

The structure of the shell in *Pinna* consists of vertically-disposed fibres on the inner surface. The young shells are very thin and brittle, being composed almost entirely of prismatic cells. Adult shells of some species attain a length of two feet. The nacreous lining of the interior does not extend as far as the ventral margin. The species of *Pinna* are found in nearly all seas. They range from low-water to sixty fathoms, usually living buried in the mud or sand with the sharp edges of the valves gaping and protruding from the surface. Pearls of an amber colour are sometimes found in the shells. Some species are used as articles of food, and others are valued for their long and silky byssus, which, mixed with silk, has been woven into gloves and other articles.

Species of Pinna.

bicolor, *Chem.*
bullata, *Gmel.*
incurvata, *Chem.*
lanceolata, *Sow.*
nobilis, *Linn.*
papyracea, *Chem.*
pernula, *Chem.*
rotundata, *Linn.*
rudis, *Linn.*

Sub-gen. ATRINA, Gray.

Shell with the apical portions of the valves entire.

inflata, *Chem.*
muricata, *Linn.*
nigra, *Chem.*
pectinata, *Linn.*
saccata, *Linn.*
senticosa, *Gould.*
serrata, *Soland.*
vexillum, *Born.*

Order PECTINACEA.

Mantle-leaves free all round, without any separate openings for the ingoing current, or the vent.

Fam. TRIGONIIDÆ.

Foot lanceolate, subulate, angulated, formed for leaping.

Shell equivalve, pearly within. Hinge composed of a few lamellar teeth interlocking with each other.

Genus TRIGONIA, Bruguière.

Shell equivalve, inequilateral, sub-trigonal; surface of valves externally longitudinally ribbed or furrowed; internally iridescent and pearly. Hinge composed of two oblong, divaricate, lamelliform teeth in the right valve transversely grooved on both sides, and four in the left valve grooved on one side only. Ligament external, thick, marginal.

Ex. T. margaritacea, *Lamarck*, pl. 124, fig. 1. Shell, T. margaritacea, fig. 1, *a*, 1, *b*.

There are five species of recent *Trigoniæ*, from the Australian seas. The animals are enabled to make considerable leaps like the Cockles by means of their angulated foot; they abound in some parts of Sydney harbour. Nearly one hundred extinct species have been discovered in the Chalk and Trias of Europe, the United States, Chili, the Cape, and Southern India.

Species of Trigonia.

Lamarckii, *Gray*.
margaritacea, *Lam*.
nobilis, *A. Adams*.
Strangei, *A. Adams*.
uniophora, *Gray*.

Genus VERTICORDIA, Searles Wood.

Shell sub-orbicular; surface of valves externally radiately ribbed, and covered with a brown epidermis; internally brilliantly pearly; margins denticulated; beaks subspiral. Hinge with two teeth in each valve; right valve with a long posterior tooth; ligament internal, oblique. Adductor scars two, faint; pallial line simple.

Syn. Hippagus, *Phil.*, not *Lea.* Trigonulina, ***D'Orb.***

Ex. V. ornata, *D'Orbigny*, pl. 124, fig. 2, 2, *a*.

The only recent species of this genus at present known was first met with by D'Orbigny in South America, and described by him under the name of *Trigonulina ornata*. The same species was subsequently named by Adams and Reeve in the "Zool. of the Samar." *H. novemcostatus*, from a specimen dredged from deep water in the China seas.

Fam. ARCIDÆ.

Animal oblong. Mantle freely open, simple or fringed; no siphons. Mouth surrounded by labia formed out of the extremities of the branchiæ; no true palps. Foot large, oblong, bent, grooved throughout its length so as to form a disk with plain or slightly-crimped margins.

Shell not pearly within, closed or gaping inferiorly, with two adductor muscles. Hinge with two teeth, each divided into transverse, interlocking plates; hinge-margin straight, curved, or angular.

Dr. Gray observes that, in the more typical form of this family, the hinge consists of two oblong or linear teeth in each valve, one placed on each side of the line directly under the umbo of the shell. These teeth are divided transversely into cross ridges, alternating and interlocking with cross ridges of the teeth of the opposite valve, and may be compared with the lateral teeth of *Spisula* in *Mactridæ* and *Meretrix* in *Veneridæ*, but more especially with the teeth of the genus *Trigonia*; only here, instead of the teeth being grooved on the sides, the grooves are sufficiently deep to divide them in the manner described.

Sub-fam. ARCINÆ.

Gills sub-pinnate, separate from each other behind. A byssal groove at the base of the foot.

Shell with the hinge-margin straight; cartilage in small marginal pits.

Genus ARCA, Linnæus.

Shell oblong, sub-quadrate, gaping in front; surface of valves covered with a paleaceous epidermis; beaks remote. Hinge-margin somewhat produced at the ends; teeth divided into numerous small, nearly equal-sized crests; ligament external; the ligamental area broad, lozenge-shaped, with a series of distant cartilage-grooves converging from the hinge-margin towards the beaks. Pallial impression entire; muscular scars very marked.

Syn. Daphne, Daphnoderma, *Poli.* Navicula, *Blainv.* Cibota, *Browne.* Byssoarca, *Swains.*

Ex. A. Noæ, *Linnæus*, pl. 124, fig. 3. Shell, A. Noæ, fig. 3, *a*, 3, *b*.

The species of *Arca* are not very numerous, and are found chiefly in tropical seas; one is a native of Britain. They often anchor themselves by means of a strong byssus to rocks and stones, or conceal themselves in holes and crevices.

Species of Arca.

angulata, *King.*
Britannica, *Reeve.*
cælata, *Reeve.*
Cumingii, *Dkr.*
cunealis, *Reeve.*
imbricata, *Brug.*
Kraussii, *Phil.*
linter, *Jonas.*

maculata, *Sow.*
mutabilis, *Sow.*
navicularis, *Brug.*
Noæ, *Linn.*
ocellata, *Reeve.*
Pacifica, *Sow.*
tetragona, *Poli.*
truncata, *Sow.*
volucris, *Reeve.*
zebra, *Swains.*

Sub-gen. LITHARCA, Gray.

Shell wedge-shaped, obliquely truncated behind, elongated and rounded in front.

lithodomus, *Sow.*

Genus BARBATIA, Gray.

Shell oblong, longitudinal, or sub-quadrate; surface of valves covered with an epidermis which is usually loose and rough. Hinge with the teeth curved, divided into broad, more or less oblique, or sub-conic plates dilated at the outer end; ligament external; ligamental area narrow, cartilage grooves angular, concentric. Pallial impression entire.

Ex. A barbata, *Linnæus*, pl. 124, fig. 4. Shell, A. barbata, fig. 4, *a*, 4, *b*.

The species of this genus are numerous, and very widely distributed; a few are inhabitants of the Arctic regions and the coasts of Britain. They, like the Arcs, attach themselves by a byssus to rocks and stones.

Species of Barbatia.

barbata, *Linn.*
cometa, *Reeve.*
cruciata, *Phil.*
decussata, *Sow.*
fasciata, *Reeve.*
fusca, *Brug.*

Gambiensis, *Reeve.*
glacialis, *Gray.*
Helblingii, *Chem.*
illota, *Sow.*
lacerata, *Linn.*
lactea, *Linn.*
lima, *Reeve.*
lurida, *Sow.*
minuta, *Reeve.*
nivea, *Gmel.*
nodulosa, *Müller.*
obliquata, *Gray.*
obtusa, *Reeve.*
olivacea, *Reeve.*
parva, *Sow.*
raridentata, *Wood.*
Reeveana, *D'Orb.*
setigera, *Reeve.*
striata, *Reeve.*
symmetrica, *Reeve.*
tenebrica, *Reeve.*
tenella, *Reeve.*
trapezina, *Lam.*
velata, *Sow.*
vespertilis, *Cpr.*
virescens, *Reeve.*
Zebuensis, *Reeve.*

Sub-gen. ACAR, Gray.

Shell with the valves cancellately ribbed or costated; hinder slope sub-carinate.

Adamsii, *Shuttl.*
bullata, *Reeve.*
divaricata, *Sow.*
Domingensis, *Lam.*
donaciformis, *Reeve.*
gradata, *Brod. and Sow.*
pulchella, *Reeve.*
pusilla, *Sow.*
sculptilis, *Reeve.*
solida, *Sow.*

Sub-gen. CALLOARCA, Gray.

Shell with the hinder slope strongly keeled; front and hinder margins dentated.

alternata, *Reeve.*

Genus ANOMALOCARDIA, Klein.

Shell thick, sub-cordate or sub-quadrate, sub-equilateral, equivalve, closed in front; surface of valves strongly radiately ribbed, and covered with an olive, smooth

or paleaceous epidermis. Hinge with the teeth oblong, dilated, and divided into numerous plates more or less oblique at the outer ends; ligament external; ligamental area broad, smooth, or with concentric cartilage grooves. Pallial impression entire.

Syn. Anadara, *Gray*.

Ex. A. antiquata, *Linnæus*, pl. 124, fig. 5, 5, *a*.

The members of this group are pretty numerous, and are widely distributed, chiefly in tropical seas.

Species of Anomalocardia.

antiquata, *Linn.*
auriculata, *Lam.*
clathrata, *Reeve.*
crebricostata, *Reeve.*
cuneata, *Reeve.*
Deshayesii, *Hanl.*
ferruginea, *Reeve.*
formosa, *Sow.*
fulgetrum, *Brod.*
gibbosa, *Reeve.*
grandis, *Brod. and Sow.*
granosa, *Linn.*
Hankeyana, *Reeve.*
hians, *Reeve.*
holoserica, *Reeve.*
inflata, *Reeve.*
lateralis, *Reeve.*
Luzonica, *Reeve.*
maculosa, *Reeve.*
multicostata, *Sow.*
navicella, *Reeve.*
obliqua, *Reeve.*
pectunculoides, *Scacchi.*
radiata, *Reeve.*
rotundicostata, *Reeve.*
scapha, *Chem.*
secticostata, *Reeve.*
similis, *C. B. Adams.*
sobria, *Gould.*
tuberculosa, *Sow.*
uropigmelana, *Bory.*

Genus NOETIA, Gray.

Shell trigonal, ventricose, inequilateral, equivalve, closed in front, hinder slope keeled; surface of valves strongly costate, and covered with a dark, foliaceous epidermis. Hinge with the anterior tooth elongated, divided into

many sub-equal plates; the hinder tooth ovate, arched, small, of a few irregular laminæ; ligament external; ligamental area narrow, smooth. Pallial impression entire.

Ex. N. reversa, *Gray*, pl. 125, fig. 1, 1, *a*.

In general appearance the shells of *Noetia* are like those of reversed *Anadaræ*. The species are few, and are from the coasts of America.

Species of Noetia.

contraria, *Reeve*.
ponderosa, *Say*.
reversa, *Gray*.

Genus SENILIA, Gray.

Shell solid, sub-cordate, equilateral, equivalve; surface of valves strongly radiately ribbed, and covered with a thin, olive, polished epidermis. Hinge with the teeth large, oblong, nearly similar, divided into large rugose, irregular cross plates; ligament external; ligamental area rather broad, with concentric cartilage grooves. Pallial impression entire.

Ex. S. senilis, *Linnæus*, pl. 125, fig. 2, 2, *a*.

The only species of *Senilia* known is met with in the brackish waters of Africa.

Genus SCAPHARCA, Gray.

Shell ovate or oblong, sub-quadrangular, sub-equilateral, inequivalve, closed in front; surface of valves strongly costate, and covered with a paleaceous epidermis. Hinge with the teeth sub-equal, dilated, and with the plate of the outer

ends more or less oblique or longitudinal; ligament external; ligamental area narrow. Pallial impression entire.

Ex. S. inæquivalvis, *Bruguière*, pl. 125, fig. 3, 3, *a*.

In *Scapharca* the valves of the shell are inequivalve like those of *Cucullæa*. The species are met with in the seas of most warm climates.

Species of Scapharca.

ambigua, *Reeve*.
angicostata, *Reeve*.
anomala, *Reeve*.
bifrons, *Cpr*.
bisulcata, *Lam*.
Brasiliana, *Lam*.
Cayenensis, *Lam*.
cepoides, *Reeve*.
chalchanthium, *Reeve*.
cistula, *Reeve*.
clathrata, *Reeve*.
compacta, *Reeve*.
concinna, *Sow*.
corbicula, *Gmel*.
cornea, *Reeve*.
cymbæformis, *Reeve*.
disparilis, *Reeve*.
emarginata, *Sow*.
globosa, *Reeve*.
gubernaculum, *Reeve*.
inæquivalvis, *Brug*.
incongrua, *Say*.
Japonica, *Reeve*.
labiata, *Sow*.
labiosa, *Sow*.
loricata, *Reeve*.
myristica, *Reeve*.
nux, *Sow*.
obesa, *Sow*.
occidentalis, *Phil*.
occlusa, *Reeve*.
ovata, *Gmel*.
pertusa, *Reeve*.
pilula, *Reeve*.
rhombea, *Born*.
rufescens, *Reeve*.
transversa, *Say*.

Genus PARALLELEPIPEDUM, Klein.

Shell sub-quadrangular, sub-equivalve, twisted, the left valve the larger and more twisted, with the hinder slope more or less keeled; surface of valves covered with a paleaceous epidermis. Hinge with the teeth divided into large oblique plates broader at the outer ends; ligament

external; ligamental area narrow; cartilage grooves angular, concentric. Pallial impression entire.

Trisidos, *Bolt.* Trisis, *Oken.*

Ex. P. tortuosa, *Linnæus*, pl. 125, fig. 4, 4, *a.*

There are but two species of *Parallelepipedum* as yet described, from India and China. The shells are readily known from those of the allied genera by the valves being twisted.

Species of Parallelepipedum.

semitortum, *Lam.* tortuosum, *Linn*

Genus CUCULLÆA, Lamarck.

Shell equivalve, inequilateral, trapeziform, ventricose, closed in front; surface of valves radiately striated, and covered with a furfuraceous epidermis. Hinge with the teeth dilated and bent down at the outer ends, divided into a few large longitudinal plates; ligament external; ligamental area moderate, smooth. Pallial impression entire; posterior muscular impression on an elevated plate.

Ex. C. concamerata, *Martini*, pl. 125, fig. 5, 5, *a.*

In this genus the posterior muscular impression is bounded by an elevated ridge. Two species only are known, from China, Nicobar, and the Mauritius. Fossil examples, forming the genus *Macrodon* of Lycett, are found in the Secondary and Palæozoic series.

Species of Cucullæa.

concamerata, *Mart.* granulosa, *Jonas.*

Genus SCAPHULA, Benson.

Shell thin, elongate, sub-trapeziform, equivalve, very inequilateral, hinder slope keeled, closed in front; surface of valves covered with a thin, smooth epidermis. Hinge with the teeth narrow, enlarged at the outer end, and divided into a few broad, oblique, nearly longitudinal laminæ; ligament external; ligamental area narrow. Pallial impression entire.

Ex. S. pinna, *Benson*, pl. 125, fig. 6, 6, *a*.

The two species of *Scaphula* known are found in the rivers of India, one in the Ganges and its branches, a thousand miles from the sea, and the other in the Tenasserim, Birmah.

Species of Scaphula.

celox, *Bens.*

pinna, *Bens.*

Genus ARGINA, Gray.

Shell sub-globose, sub-cordate, sub-equivalve, inequilateral; surface of valves strongly radiately costate, and covered with a brown, foliaceous epidermis. Hinge with the hinder tooth elongated, curved, the central crest small; ligament external; ligamental area narrow, smooth. Pallial impression entire.

Ex. A. pexata, *Say*, pl. 125, fig. 7, 7, *a*.

The character by which the shells of *Argina* may be easily known is the curved and shortened anterior tooth, the plates of which are crowded together and irregular. The species are inhabitants of the coasts of America.

Species of Argina.

Americana, *Gray.*	Indica, *Gmel.*
brevifrons, *Sow.*	pexata, *Say.*

Genus LUNARCA, Gray.

Shell globose, sub-cordiform, nearly equivalve; surface of valves radiately costate, and covered with a brown, foliaceous epidermis. Hinge with the hinder tooth elongate, narrow in the middle; the front tooth of the left valve ovate, elevated, entire, fitting into a cavity in the inner edge of the front margin of the right valve; ligament external; ligamental area narrow, smooth. Pallial impression entire.

Ex. L. costata, *Gray*, pl. 125, fig. 8, 8, *a*.

This genus, of which only one species is known, from America, is peculiar from the anterior hinge-tooth being entire and without the usual divisions.

Sub-fam. AXINÆINÆ.

Gills dependent. Foot securiform, simple, without any byssal groove at the base.

Shell orbicular, with the hinge-margin semicircular; cartilage in small marginal pits.

Genus AXINÆA, Poli.

Shell equivalve, equilateral, or nearly so, orbicular, closed; surface of valves smooth, or striated, or with radiating furrows, invested with a fimbriated epidermis; mar-

gins of valves plain, or crenate; beaks separated by a grooved, lanceolate, ligamental area. Hinge semicircular, with the teeth divided into small, oblique, interlocking plates; ligament external. Muscular scars very strongly marked; pallial impression entire.

Syn. Tucota, *Bolten.* Glycimeris, ***Humph.*** Axinoderma, *Poli.*

Ex. A. glycimeris, *Linnæus*, pl. 126, fig. 1. Shell, A. glycimeris, fig. 1, *a*, 1, *b*.

Out of forty-five species of *Pectunculi*, whose habitats are pretty well known, nearly one-half will be found distributed in America, leaving the remainder to be divided between the regions of Europe, Asia, Africa, and Australia. They inhabit sandy and muddy coasts, ranging from shallow water to upwards of one hundred fathoms. One species, *A. glycimeris*, is found in Great Britain and in the Mediterranean.

Species of Axinæa.

angulata, *Chem.*
aspersa, *Adams and Reeve.*
bimaculata, *Poli.*
decussata, *Linn.*
flammea, *Reeve.*
formosa, *Reeve.*
gigantea, *Reeve.*
glycimeris, *Linn.*
holoserica, *Reeve.*
intermedia, *Brod.*
lineata, *Reeve.*
longior, *Sow.*
maculata, *Brod.*
marmorata, *Chem.*
oblique, *Reeve.*
ovata, *Brod.*
pallens, *Linn.*
pennacea, *Lam.*
perdix, *Reeve.*
pilosa, *Lam.*
radians, *Lam.*
raripicta, *Reeve.*
rubens, *Lam.*
scripta, *Born.*
sculpta, *Born.*
septentrionalis, *Midd.*
spadicea, *Reeve.*
stellata, *Gmel.*
striatularis, *Lam.*
tellinæformis, *Reeve.*
transversa, *Lam.*
undata, *Linn.*
zonalis, *Lam.*

Sub-gen. PECTUNCULUS, Lamarck, *not* Adanson.

Valves with prominent, radiating, longitudinal ribs, either with or without transverse striæ.

æquilatera, *Gmel.*
assimilis, *Sow.*
auriflua, *Reeve.*
bicolor, *Reeve.*
Delessertii, *Reeve.*
inæqualis, *Sow.*
laticostata, *Quoy and Gaim.*
morum, *Reeve.*
multicostata, *Reeve.*
nodosa, *Reeve.*
oculata, *Reeve.*
pallium, *Reeve.*
parcipicta, *Reeve.*
pectinata, *Gmel.*
pectinoides, *Desh.*
pertusa, *Reeve.*
rosea, *Reeve.*
sericata, *Reeve.*
spurca, *Reeve.*
striatulata, *Sow.*
strigillata, *Sow.*
tenuicostata, *Reeve.*
tessellata, *Sow.*
variegata, *Chem.*
vitrea, *Lam.*

Genus LIMOPSIS, Sassi.

Shell orbicular, convex, slightly oblique. Hinge with the teeth divided into two equal, curved series of transverse plates; ligamental area with a triangular cartilage-pit in the centre. Muscular impressions distinct; pallial line simple.

Syn. Pectunculina, *D'Orb.* Trigonocœlia, *Nyst.*

Ex. L. multistriata, *Forskäl,* pl. 126, fig. 2, 2, *a.*

The hinge-plate in this genus has a distinct triangular cartilage-pit. There are four recent species known; *L. multistriata* is from the Red Sea; *L. Belcheri,* Adams and Reeve, was dredged off the Cape of Good Hope from a depth of one hundred and twenty fathoms; *L. cancellata* is not uncommon at Singapore; and *L. borealis* is from Norway.

Species of Limopsis.

Belcheri, *Adams and Reeve.*
borealis, *Woodw.*
cancellata, *Reeve.*
multistriata, *Forsk.*

Fam. NUCULIDÆ.

Lips broad, triangular, large, striated internally, one in each pair of labial palps, long, curled, linear, and fimbriated at its margins, the other short and filiform. Mantle freely open, the edges simple, without siphonal tubes; gills small, pinnate, united behind. Foot compressed, deeply grooved, forming, when expanded, an ovate disk with serrated edges.

Shell covered with an epidermis, pearly within. Hinge with two teeth, each numerously and transversely divided; ligament internal, small, central. Two adductor muscular impressions.

Genus NUCULA, Lamarck.

Shell trigonal or obliquely ovate, closed, anterior side the shorter; surface of valves smooth or concentrically grooved, covered with a smooth olive epidermis; nacreous within; beaks approximated, incurved; margin of valves smooth or denticulated. Hinge-line angulated, a prominent internal cartilage-pit at the angle; teeth forming a range of comb-like denticles on each side; ligament chiefly internal. Pallial impression simple.

Syn. Nuculana, *Link.* Polydonta, *Mühlf.*, not *Schum.*

Ex. N. nucleus, *Linnæus*, pl. 126, fig. 3. Shell, N. nucleus, fig. 3, *a*, 3, *b*.

The species of *Nucula* are found in all seas, in the

United States, Norway, the Cape, Japan, Sitka, and Chili. They are usually from deep water, ranging from ten to one hundred fathoms. There are very numerous extinct species from the Trias of Europe, India, and America. The Nuculas differ from the Arks in the form of the gills, the great development of the labial tentacles, the absence of a byssus, and the pearly nature of the shell. Dr. Carpenter remarks that the inner layer of the shell exhibits a truly nacreous structure, and that in the outer a small amount of tubular structure may be observed.

Species of Nucula.

Bellotii, *A. Adams.*
castanea, *A. Adams.*
convexa, *Sow.*
crenulata, *A. Adams.*
Cumingii, *Hinds.*
declivis, *Hinds.*
decussata, *Sow.*
delphinodonta, *Migh.*
exigua, *Sow.*
gibba, *A. Adams.*
Japonica, *A. Adams.*
Layardii, *A. Adams.*
lucida, *Gould.*
margaritacea, *A. Adams.*
marmorea, *Hinds.*
mitralis, *Hinds.*
nana, *Hinds.*
nitida, *Sow.*
nitidula, *A. Adams.*
obliqua, *Lam.*
paulula, *A. Adams.*
Paytensis, *A. Adams.*
pisum, *Sow.*
Polii, *Phil.*
proxima, *Say.*
pulchra, *Hinds.*
radiata, *Hanley.*
rugulosa, *Sow.*
simplex, *A. Adams.*
Strangei, *A. Adams.*
striolata, *A. Adams.*
sulcata, *A. Adams.*
tenuis, *Mont.*
tumida, *Hinds.*

Sub-gen. ACILA, H. and A. Adams.

Shell with the surface of the valves divaricately sculptured.

castrensis, *Hinds.*
divaricata, *Hinds.*
mirabilis, *Adams and Reeve.*

Fam. LEDIDÆ.

Labial palps appendiculate, convoluted, very long. Mantle freely open, the margins fringed and usually furnished with ventral lobes; siphonal tubes united, long, slender, and completely retractile; gills narrow, plume-like, attached throughout their length. Foot compressed, slightly geniculate, deeply grooved, forming an oval disk with crenate edges.

Shell oblong, thin, pearly within. Hinge with two teeth transversely divided; ligament internal or external.

Sub-fam. LEDINÆ.

Shell pearly within; ligament internal.

Genus LEDA, Schumacher.

Shell equivalve, inequilateral, oblong, produced posteriorly, closed; surface of valves smooth or concentrically striated, invested by an epidermis; inside more or less nacreous; margins smooth; beaks approximated, incurved. Hinge-line angulated; teeth divided into numerous comb-like denticles on each side; ligament internal. Pallial line slightly sinuated.

Syn. Lembulus, *Risso.*

Ex. L. emarginata, *Lamarck*, pl. 126, fig. 4. Shell, L. pernula, *Müller*, fig. 4, *a*, 4, *b*.

The species of *Leda* have a wide geographical distribution, being found in deep water in the Northern and Arctic seas, Siberia, Britain, Japan, Australia, the Cape, and the West Indies.

Species of Leda.

arctica, *Gray.*
Belcheri, *Hinds.*
bellula, *A. Adams.*
buccata, *Stimp.*
cælata, *Hinds.*
Chuva, *Gray.*
complanata, *Möll.*
costellata, *Sow.*
crassa, *Hinds.*
crispa, *Hinds.*
cuneata, *Sow.*
curvirostrata, *Sow.*
decens, *A. Adams.*
delectabilis, *A. Adams.*
eburnea, *Sow.*
Elenensis, *Sow.*
emarginata, *Lam.*
excavata, *Hinds.*
fabula, *Sow.*
fastidiosa, *A. Adams.*
fulgida, *A. Adams.*
gibbosa, *Sow.*
hyperborea, *Lovén.*
inconspicua, *A. Adams.*
inornata, *A. Adams.*
Jamaicensis, *D'Orb.*
lata, *Hinds.*
lepida, *A. Adams.*
lugubris, *A. Adams.*
lyrata, *Hinds.*
micans, *A. Adams.*
minuta, *Müll.*
nasuta, *Sow.*
ornata, *D'Orb.*
pella, *Linn.*
pernula, *Müll.*
plicifera, *A. Adams.*
polita, *Sow.*
Portlandica, *Hitchcock.*
puellata, *Hinds.*
recta, *Hinds.*
recurva, *Conr.*
semisulcata, *A. Adams.*
serotina, *Hinds.*
siliqua, *Reeve.*
Sowerbyana, *D'Orb.*
striata, *Sow.*
sulculata, *Gould.*
tenuisulcata, *Couth.*
ventricosa, *Hinds.*
vitrea, *D'Orb.*

Sub-gen. ADRANA, H. and A. Adams.

Shell thin, gaping at the extremities.

concinna, *A. Adams.*
crenifera, *Sow.*
decora, *A. Adams.*
electa, *A. Adams.*
elongata, *Sow.*
gloriosa, *A. Adams.*
lanceolata, *Lam.*
Patagonica, *D'Orb.*
tellinoides, *Wood.*

Genus YOLDIA, Möller.

Shell compressed, oblong, somewhat narrowed behind: surface of valves smooth or obliquely sculptured, covered with an olive, polished epidermis; slightly pearly within. Hinge with the teeth divided into comb-like denticles; cartilage in a central pit. Pallial line deeply sinuated.

Ex. Y. pygmæa, *Münster*, pl. 136, fig. 5. Shell, Y. limatula, *Say*, fig. 5, *a*, 5, *b*.

The species of *Yoldia* are chiefly northern in their geographical range, being found in the Arctic and Antarctic seas, Norway, Greenland, Kamtschatka, and Massachusetts in North America. The animal in *Yoldia* is said to be destitute of the ventral lobes seen at the hind margin of the mantle in *Leda* and *Neilo*.

Species of Yoldia.

arctica, *Gray*.
Cascoensis, *Migh. and Adams*.
glacialis, *Gray*.
Japonica, *Adams and Reeve*.
lævigata, *Spengl*.
lepidula, *A. Adams*.
limatula, *Say*.
lucida, *Lovén*.
Mülleri, *Gray*.
myalis, *Couth*.
navicularis, *Couth*.
Nicobarica, *Lam*.
obesa, *Stimp*.
pygmæa, *Münst*.
retusa, *Hinds*.
sapotilla, *Gould*.
splendida, *Phil*.
tenella, *Hinds*.
thraciæformis, *Storer*.

Sub-fam. MALLETIINÆ.

Shell with the valves sometimes slightly nacreous within; ligament external.

Genus MALLETIA, Desmoulins.

Shell oval, compressed, smooth; surface of valves covered with an olivaceous epidermis; interior sub-nacreous. Hinge with the posterior tooth and part of the anterior tooth divided into fine, sharp denticles; ligament external, elongated, prominent. Muscular impressions wide apart; pallial sinus large and deep.

Syn. Solenella, *Sowerby*. Ctenoconcha, *Gray*.

Ex. M. Chilensis, *Desmoulins*, pl. 126, fig. 6, 6, *a*.

The only species of *Malletia* at present known is from Valparaiso.

Genus NEILO, H. and A. Adams.

Shell transverse, Ark-shaped, posteriorly gaping and subtruncate; surface of valves covered with a thin, brown epidermis, concentrically furrowed; inside not nacreous. Hinge-line nearly straight; teeth with numerous small, acute, comb-like denticles; ligament external, conspicuous. Muscular scars wide apart; pallial line with a deep sinus.

Ex. N. Cumingii, *A. Adams*, pl. 126, fig. 7. Shell, N. Cumingii, fig. 7, *a*, 7, *b*.

The mantle-margin in *Neilo* is double, and the outer edge is fringed, and furnished behind with ventral lobes; the siphons are long, slender, united, and retractile; the labial palps are elongated, fimbriated at their margins, and appendiculate; the gills are narrow; and the foot is large, geniculate, compressed, and folded, forming an oval disk with crenate margins. This genus, which is known from *Malletia* by its Ark-like form, and by the surface of the

valves being sculptured, at present comprises but a single recent species, from New Zealand. The denticles of the anterior tooth extend in as numerous a series as those of the posterior tooth, which is not the case in *Malletia*.

Fam. PECTINIDÆ.

Mouth surrounded by foliaceous leaflets; labial palps truncated, smooth externally, pectinated within. Mantle freely open, the margins double, the inner pendent, bearing fringes of tentacular filaments, and at its base a row of eye-like spots or ocelli; branchial leaflets equal, each pair partially doubled on itself. Foot small, cylindrical, with a byssal groove. Sexes united.

Shell free, auricled. Ligament wholly or partially internal, lodged in a cardinal groove. Adductor muscles united, leaving a single impression in the shells.

Genus PECTEN, Linnæus.

Shell oblong or sub-orbicular, regular, equivalve, closed; surface of valves usually with radiating scaly ribs; beaks approximated; anterior auricles the larger, the right one with a byssal sinus. Hinge-line straight; ligament marginal, linear; cartilage central, lodged in a triangular pit. Muscular scar large, sub-central; pallial line entire.

Syn. Argus, *Poli*.

Ex. P. varius, *Linnæus*, pl. 127, fig. 1. Shell, P. pallium, *Linnæus*, fig. 1, *a*, 1, *b*.

The foot in these animals is not adapted for crawling, but is used chiefly as an exploring organ, and to anchor

them when required by spinning a temporary byssus. The young swim freely about in a rapid and zigzag manner by the sudden opening and closing of their valves. The structure of the shell, according to Dr. Carpenter, consists of membranous, corrugated lamellæ, disposed in two layers, with occasional traces of cellularity on the external surface, which sometimes assume the character of a prismatic cellular layer. The Pectens, as shown by Lesson, are enabled to leap out of the water by striking their valves rapidly together. The surface of the valves is usually adorned with brilliant and varied colors. *Pecten maximus* and *P. opercularis* are regarded by epicures as dainty articles of diet. The shell of *P. Jacobæus* was formerly worn as a badge by pilgrims who had been to the Holy Land. The Pectens are world-wide in their geographical distribution, and are very numerous in species.

Species of Pecten.

altus, *Reeve.*
asperrimus, *Lam.*
asperulatus, *Adams and Reeve.*
aurantiacus, *Adams and Reeve.*
australis, *Sow.*
blandus, *Reeve.*
Bruei, *Payr.*
circularis, *Sow.*
cloacatus, *Reeve.*
concinnus, *Reeve.*
corallinoides, *D'Orb.*
coruscans, *Hinds.*
cretatus, *Reeve.*
cristularis, *Adams and Reeve.*
crotilus, *Reeve.*
cruentatus, *Reeve.*
Cumingii, *Reeve.*
cuneolus, *Reeve.*
Darwinii, *Reeve.*
daucus, *Reeve.*
denticulatus, *Adams and Reeve.*
Dieffenbachi, *Gray.*
distans, *Lam.*
Dringi, *Reeve.*
effulgens, *Reeve.*
erubescens, *Reeve.*
exasperatus, *Sow.*
Fabricii, *Reeve.*
florens, *Lam.*
fricatus, *Reeve.*
fucatus, *Reeve.*
fulvicostatus, *Adams and Reeve.*

funebris, *Reeve.*
gemmeus, *Reeve.*
gemmulatus, *Reeve.*
gibbus, *Linn.*
gloriosus, *Reeve.*
hastatus, *Sow.*
imbricatus, *Gmel.*
irradians, *Lam.*
larvatus, *Reeve.*
Layardi, *Reeve.*
lemniscatus, *Reeve.*
lentiginosus, *Reeve.*
leopardus, *Reeve.*
leucophæus, *Reeve.*
limatula, *Reeve.*
lividus, *Lam.*
luculenta, *Reeve.*
magnificus, *Sow.*
miles, *Reeve.*
miniaceus, *Reeve.*
multicostatus, *Reeve.*
mundus, *Reeve.*
muscosus, *Wood.*
niveus, *Macgilliv.*
nobilis, *Reeve.*
nodosus, *Linn.*
nucleus, *Born.*
nux, *Reeve.*
opercularis, *Lam.*
pallium, *Linn.*
parvus, *Sow.*
Patagonicus, *King.*
pes-felis, *Linn.*
pica, *Reeve.*
pictus, *Sow.*
prunum, *Reeve.*
pseudolima, *Sow.*
purpuratus, *Lam.*
radula, *Linn.*
Reevei, *A. Adams.*
reticulatus, *Reeve.*
roseopunctatus, *Reeve.*
rufiradiatus, *Reeve.*
rugosus, *Sow.*
russatus, *Reeve.*
sanguineus, *Linn.*
sanguinolentus, *Gmel.*
saniosus, *Reeve.*
senatorius, *Gmel.*
sentis, *Reeve.*
serratus, *Sow.*
Singaporensis, *Sow.*
solaris, *Born.*
solidulus, *Reeve.*
Sowerbyi, *Reeve.*
speciosus, *Reeve.*
spectrum, *Reeve.*
spiniferus, *Sow.*
splendidus, *Sow.*
squamatus, *Gmel.*
subnodosus, *Sow.*
subrufus, *Turton.*
sugillatus, *Reeve.*
superbus, *Sow.*
tegula, *Wood.*
tenellus, *Reeve.*
testudineus, *Reeve.*
textilis, *Reeve.*
tigris, *Lam.*
tinctus, *Reeve.*
triradiatus, *Reeve.*
undatus, *Born.*
ustulatus, *Reeve.*
varius, *Linn.*
ventricosus, *Sow.*
vestalis, *Reeve.*
vexillum, *Reeve.*

Sub-gen. CHLAMYS, Bolten.

Shell sub-equivalve; valves radiately striated, or irregularly ribbed.

albolineatus, *Sow.*
bifrons, *Lam.*
cuneatus, *Reeve.*
irregularis, *Sow.*
Islandicus, *Chem.*
lætus, *Gould.*
madreporarum, *Petit.*
ornatus, *Lam.*
rubidus, *Hinds.*
striatus, *Müll.*
tenuigranosus, *Reeve.*
vitreus, *Chem.*

Sub-gen. PALLIUM, Martini (Dentipecten, *Rüppell.* Decadopecten, *Sow.*).

Shell equivalve; valves longitudinally plicate. Hinge line obscurely toothed.

anthriticus, *Reeve.*
digitatus, *Hinds.*
fasciculatus, *Hinds.*
flabelloides, *Reeve.*
flagellatus, *Lam.*
pes-anatis, *Reeve.*
plica, *Linn.*
Strangei, *Reeve.*
subplicatus, *Sow.*
velutinus, *Sow.*

Sub-gen. PSEUDAMUSSIUM, Klein.

Shell fan-shaped, thin, sub-equivalve; valves longitudinally plicate, smooth or finely striated.

argenteus, *Reeve.*
clavatus, *Poli.*
corneus, *Sow.*
flexuosus, *Poli.*
glaber, *Linn.*
Grœnlandicus, *Sow.*
hyalinus, *Poli.*
hybridus, *Gmel.*
imbrifer, *Lovén.*
latiauratus, *Conr.*
mirificus, *Reeve.*
mollitus, *Reeve.*
nasans, *Phil.*
Proteus, *Soland.*
septemradiatus, *Müll.*
similis, *Lask.*
squamosus, *Gmel.*
stellatus, *Reeve.*
sulcatus, *Born.*
tigrinus, *Müll.*
undulatus, *Sow.*

Genus VOLA, Klein.

Shell sub-orbicular, inequivalve, closed, the upper valve flattened; surface of valves radiately ribbed; auricles nearly equal. Hinge-line straight; ligament marginal, narrow; cartilage pit central. Muscular impression large, sub-central; pallial line simple.

Syn. Pandora, *Mühlf.*, not *Soland.* Janira, *Schum.*

Ex. V. Jacobæa, *Linnæus*, pl. 127, fig. 2. Shell, V. maxima, *Linnæus*, fig. 2, *a*, 2, *b*.

The species of *Vola* are not very numerous, but are widely dispersed. The chief character by which the shell can be distinguished is the flatness of the upper valve.

Species of Vola.

aspera, *Sow.*
dentata, *Sow.*
Erythræensis, *Sow.*
filosa, *Reeve.*
florida, *Hinds.*
fumata, *Reeve.*
fusca, *Klein.*
histrionica, *Gmel.*
Idæus, *Reeve.*
inequivalvis, *Sow.*
Jacobæa, *Linn.*
laqueata, *Sow.*
maxima, *Linn.*
media, *Lam.*
modesta, *Reeve.*
Novæ Zelandiæ, *Reeve*
pulchella, *Reeve.*
pyxidata, *Born.*
sericeus, *Hinds.*
similis, *Sow.*
Sinensis, *Sow.*
spectabilis, *Reeve.*
subviridis, *Sow.*
sulcicostata, *Sow.*
unicolor, *Lam.*
zic-zac, *Linn.*

Genus AMUSSIUM, Klein.

Shell orbicular, sub-equivalve, thin, gaping at the sides; surface of valves smooth: auricles sub-equal, the right

anterior one with a slight sinus. Hinge-line angulated; ligament linear; cartilage-pit central. Muscular impression sub-central, large; pallial line simple.

Syn. Amusium, *Mühlf.* Pleuronectia, *Swains.*

Ex. A. pleuronectes, *Linnæus*, pl. 127, fig. 3, 3, *a*.

The species of this genus are few in number, and are inhabitants of the Indian seas, and the coast of North America.

Species of Amussium.

caurinum *Gould.*
Japonicum, *Gmel.*
Laurentii, *Gmel.*
Magellanicum, *Gmel.*
obliteratum, *Lam.*
orbiculare, *Sow.*
pleuronectes, *Linn.*

Genus HINNITES, Defrance.

Shell oval, irregular, inequivalve, closed, adherent by the right valve; surface of right valve irregular, of left valve longitudinally grooved or scaly; auricles unequal, the posterior the larger, with a sinus in the right one. Hinge-margin straight; ligament long, narrow; cartilage-pit central. Muscular impression very large and rounded; pallial impression strongly marked, entire.

Syn. Hinnita, *Gray.*

Ex. H. pusio, *Linnæus*, pl. 127, fig. 4, 4, *a*.

In this genus the lower valve of the shell in the adult state is attached to foreign bodies, and becomes irregular. One species is met with on the coasts of Britain, the others are from Western America.

Species of Hinnites.

giganteus, *Gray.*
Poulsoni, *Conr.*
pusio, *Linn.*

Genus HEMIPECTEN, Adams and Reeve.

Shell inequivalve, irregular, hyaline, the superior valve slightly auriculated, the inferior valve posteriorly conspicuously auriculate, deeply sinuated and denticulate beneath the auricle. Hinge edentulous; ligament marginal; cartilage small, in a central cavity.

Ex. H. Forbesianus, *Adams and Reeve*, pl. 127, fig. 5, 5, *a*.

In this genus the margin of the sinus, as in many species of *Pecten*, is furnished with a row of sharp erect denticles. From the Anomia-like appearance of the shell, it probably lives attached to foreign bodies. The single species known is from the Sooloo Archipelago.

Fam. RADULIDÆ.

Body produced, in part linguiform. Mouth surrounded by tentacular filaments. Mantle without any ocelli on the edge, the margin fringed with tentacular filaments; anal tube cylindric, visible externally. Foot compressed, not byssiferous.

Shell gaping at the sides, usually white. Hinge edentulous.

Genus RADULA, Klein.

Shell more or less obliquely oblong, equivalve, closed in front, more or less gaping at the sides; surface of valves usually grooved in a radiating manner, the ribs scaly;

beaks separated by a rhomboidal area, eared on each side. Ligament on each side of a strong cartilage placed in a triangular pit under the beaks. Muscular scar eccentric; pallial line entire.

Syn. Lima, *Brug.* Limaria, *Link.* Glaucion, *Oken.*

Ex. R. inflata, *Chemnitz*, pl. 128, fig 1. Shell, L. lima, *Linnæus*, fig. 1, *a*, 1, *b*.

In this genus the valves of all the species are white or colourless, and the substance of the shell is composed of plicate lamellæ externally, and with a network of minute tubuli in the inner layer. Some are covered with a thin brown epidermis. Some species are peculiar to northern seas; a few are inhabitants of our own coasts; and others are found in America and the West Indies. The animals swim freely about, like the Pectens, by flapping their valves; and sometimes they spin a byssus, and even form a sort of nest, by weaving fragments of coral and shell into their byssus, in which they live gregariously.

Species of Radula.

Caribæa, *D'Orb.*
lima, *Linn.*
multicostata, *Sow.*
paucicostata, *Sow.*
vulgaris, *Link.*

Sub-gen. CTENOIDES, Klein.

Shell thin, sub-equilateral, hardly gaping posteriorly; ribs divaricate, meeting in the centre. Hinge margin nearly straight.

scabra, *Born.*
tenera, *Chem.*

Sub-gen. MANTELLUM, Bolten.

Shell thin, ventricose, oblique; hind side of shell widely gaping. Hinge-margin oblique; cartilage-pit central, projecting into the cavity of the shell.

angulata, *Sow.*
arcuata, *Sow.*
Basilanica, *Adams and Reeve.*
Cumingii, *Sow.*
dentata, *Sow.*
fasciata, *Linn.*
fragilis, *Chem.*
hians, *Gmel.*
inflata, *Chem.*
Loscombii, *Leach.*
orientalis, *Adams and Reeve.*
rotundata, *Sow.*
ventricosa, *Sow.*

Sub-gen. ACESTA, H. and A. Adams.

Shell thin, inequilateral, ventricose, radiately striated, slightly gaping. Hinge with the cartilage-pit oblong, elongate, under the anterior auricle.

excavata, *Chem.*

Sub-genus LIMATULA, Searles Wood.

Shell nearly equilateral, slightly gaping, auricles nearly equal. Hinge-margin thick; cartilage-pit central, large, projecting into the cavity.

bullata, *Born.*
subauriculata, *Montagu.*

Genus LIMÆA, Bronn.

Mantle margins simple, without tentacular filaments.

Shell sub-globose, roundly ovate, sub-equilateral, closed; surface of valves with squamose, radiating ribs; beaks prominent; margins crenate. Cardinal margins rather oblique,

straight, with about fifteen denticles on each side; cartilage pit triangular, the area slightly concave and longitudinally striated. Muscular impression sub-central; pallial line simple.

Ex. L. Sarsii, *Lovén*, pl. 128, fig. 2, 2, *a*.

Of this curious genus there is but one species yet described, from Norway and the Mediterranean.

Fam. SPONDYLIDÆ.

Mouth with foliaceous lips; palps short, oblong, pointed. Mantle freely open, the margins thickened, and furnished with numerous rows of tentacular cirrhi, many of which are truncate, and end in a smooth, convex surface; gills large, equal, separate. Foot small, cylindrical, truncated, ending in a disk, from the depressed centre of which issues a small, cylindrical tendon terminating in a small, oviform, fleshy mass.

Shell irregular, attached by the right valve, radiately ribbed, spiny, or foliaceous.

Genus SPONDYLUS, Linnæus.

Shell inequivalve, adherent, spiny or rough; beaks unequal, eared; inferior valve with an external, flat, triangular cardinal area, divided by a groove, and enlarging with age. Hinge with two strong teeth in each valve, with an intermediate ligamental pit, communicating at its base with the external groove; ligament internal. Muscular impression double; pallial line entire.

Syn. Podopsis, *Lam.* (foss.) Dianchora, *Sow.* (foss.) Pachytes, *Defr.* (foss.)

Ex. S. gæderopus, *Linnæus*, pl. 128, fig. 3, 3, *a*.

The "Thorny Oysters" inhabit the coasts of Western America, the Pacific Islands, India, Australia, and the Mediterranean. They are usually found in deep water, adhering to rocks and coral. The valves are adorned with spines, and are often vividly coloured. From the fact of cavities containing fluid being found in the inner layer of the shell, they are sometimes termed "Water Clams."

Species of Spondylus.

aculeatus, *Chem.*
affinis, *Reeve.*
albibarbatus, *Reeve.*
Americanus, *Lam.*
armatus, *Sow.*
asperrimus, *Sow.*
aurantius, *Lam.*
barbatus, *Reeve.*
basilicus, *Reeve.*
Butleri, *Reeve.*
calcifer, *Cpr.*
camurus, *Reeve.*
candidus, *Lam.*
castus, *Reeve.*
chelonia, *Reeve.*
ciliatus, *Brod.*
coccineus, *Lam.*
croceus, *Chem.*
Cumingii, *Sow.*
cuneus, *Reeve.*
digitatus, *Sow.*
ducalis, *Chem.*
electrum, *Reeve.*
erinaceus, *Reeve.*
flabellum, *Reeve.*
foliaceus, *Chem.*
fragilis, *Sow.*
fragum, *Reeve.*
gæderopus, *Linn.*
gilvus, *Reeve.*
gracilis, *Chem.*
Gussoni, *Costa.*
hystrix, *Reeve.*
ictericus, *Reeve.*
imbutus, *Reeve.*
imperialis, *Chenu.*
Lamarckii, *Chenu.*
Layardi, *Reeve.*
leucacantha, *Brod.*
limbatus, *Sow.*
lingua-felis, *Sow.*
longitudinalis, *Lam.*

microlepos, *Lam.*
multimuricatus, *Reeve.*
multisetosus, *Reeve.*
mus, *Reeve.*
Nicobaricus, *Chem.*
nudus, *Chem.*
nux, *Reeve.*
ocellatus, *Reeve.*
Pacificus, *Reeve.*
pictorum, *Chem.*
plurispinosus, *Reeve.*
princeps, *Brod.*
radula, *Reeve.*
ramosus, *Reeve.*
regius, *Gmel.*
rubicundus, *Reeve.*
setiger, *Reeve.*
Sinensis, *Sow.*
spectrum, *Reeve.*
tenebrosus, *Reeve.*
tenellus, *Reeve.*
tenuispinosus, *Sow.*
unicolor, *Sow.*
ustulatus, *Reeve.*
varians, *Sow.*
variegatus, *Chem.*
vexillum, *Reeve.*
violaceus, *Reeve.*
virgineus, *Reeve.*
zonalis, *Chenu.*

Genus PLICATULA, Lamarck.

Shell inequivalve, plicate, irregular, attached by the beak of the right valve; beaks unequal, not eared; hinge-area indistinct. Hinge with two strong, diverging, cross-grained cardinal teeth in each valve, with an intermediate pit for the internal cartilage. Muscular impression simple; pallial line entire.

Ex. P. plicata, *Forskäl*, pl. 128, fig. 4, 4, *a*.

The fossil representatives of this genus, of which there are upwards of forty species from the Trias of Europe, the United States, Algeria, and India, have had the name of *Harpax* bestowed on them by Parkinson. The recent species, about nine in number, are chiefly from the Philippines, Australia, and Western America.

Species of Plicatula.

australis, *Lam.*
cristata, *Lam.*
deltoidea, *Dkr.*
depressa, *Lam.*
lineata, *Recluz.*
penicillata, *Cpr.*
plicata, *Forsk.*
regularis, *Phil.*
reniformis, *Lam.*

Genus PEDUM, Bruguière.

Shell thin, smooth, compressed; beaks unequal, diverging, slightly eared; right valve deeply notched for the passage of the byssus. Hinge edentulous; cartilage internal, in a central cartilage-pit; ligament partly external. Adductor scar double; pallial line simple.

Ex. P. spondyloideum, *Gmelin*, pl. 128, fig. 5. Shell, P. spondyloideum, fig. 5, *a*, 5, *b*.

The mantle-margin in *Pedum* is furnished with numerous tentacular filaments, as in *Spondylus*, with small, smooth tubercles between them placed at equal distances; there is a fissure in the mantle on the right side for the passage of the byssus. The foot is small and vermiform, with a thick, silky byssus at its base. The *Pedum*, of which one species only is known, from the Red Sea, the Indian Ocean, and the Mauritius, inhabits coral-reefs, to which it is anchored by a byssus, which passes out of the deep notch in the right valve; it is often found partially buried in masses of madrepores.

Fam. ANOMIIDÆ.

Mouth with narrow, plain lips, confluent with the gills; palps obsolete. Mantle quite open, except at the hinge, with a double pendent margin, fringed with short cirrhi; no ocelli; gills two on each side, unsymmetrical, united posteriorly, and suspended by two falciform membranes; outer gill-lamina furnished with a broad reflexed margin. Foot small, cylindrical, expanded at the end and grooved. Sexes distinct; generative organs combined with the right mantle-lobe. Ventricle exposed, not perforated by the rectum. Byssus large, laminar, passing through a nearly complete foramen in the right mantle-lobe, and attached by a powerful muscle to the centre of the left valve. Adductor moderate; pallial line continuous.

Shell deeply emarginated or perforated near the beak on one side by a large ovate or round sinus, through which the adductor muscle passes attached to the opercular shelly plug.

Genus ANOMIA, Linnæus.

Shell orbicular, or oblong. Byssal notch distinct; the upper part of the anterior lobe of the notch separate from, and often partially overlapping, the front of the cardinal edge. Plug thick, elongate, entirely shelly, and quite free from the edge of the notch. Upper valve with three sub-central muscular scars.

Syn. Echion, Echionoderma, *Poli.* Fenestella, *Bolten.* Lampades, *Gevers.* Cepa, *Humph.*

Ex. A. ephippium, *Linnæus*, pl. 129, fig. 1. Shell, A. ephippium, fig. 1, *a*, 1, *b*.

There are about nineteen species of ***Anomia***, which are very varied in their geographical distribution, being found in the European and Mediterranean seas, North America, India, and Australia. They range from low-water to one hundred fathoms, and often take the form of the bodies to which they are attached. In France they are eaten, but with us they are not considered edible. The shells are attached by the calcareous plug which passes through the aperture in the lower valve.

Species of Anomia.

Achæus, *Gray*.
Acontes, *Gray*.
adamas, *Gray*.
Alectus, *Gray*.
Amabæus, *Gray*.
australis, *Gray*.
Belesis, *Gray*.
Chinensis, *Phil*.
Cytæum, *Gray*.
Dryas, *Gray*.
ephippium, *Linn*.
Fidenas, *Gray*.
Hamillus, *Gray*.
Lampe, *Gray*.
Larbas, *Gray*.
Pacilus, *Gray*.

Sub-gen. ÆNIGMA, Koch.

Shell oblong, transverse; upper scar large; the two lower scars smaller, far behind the upper one.

ænigmatica, *Chem*.
naviformis, *Jonas*.

Sub-gen. PATRO, Gray.

Shell sub-orbicular; two upper scars small, the lower one large.

Elyros, *Gray*.

Genus PLACUNANOMIA, Broderip.

Shell ovate. Byssal notch distinct, converted into a hole by the upper part of the anterior lobe of the notch being soldered to, and forming part of, the cardinal edge. Plug triangular, gradually enlarging in size; apex and outer surface next to the body to which it is attached calcareous, longitudinally striated; inner surface covered with horny, longitudinal, parallel laminæ, and more or less agglutinated to the edge of the notch. Upper or dorsal valve with two sub-central muscular scars, the upper scar radiately veined.

Ex. P. macrochisma, *Deshayes*, pl. 129, fig. 2. P. Cumingii, *Broderip*, fig. 2, *a*.

The type of this genus, *P. Cumingii*, was dredged by Mr. Cuming in the Gulf of Dulce in Central America; the other species are from the West Indies, California, Australia, and Europe. They live attached to dead shells, stones, and coral.

Sub-gen. PODODESMUS, Philippi.

Shell with the surface of the valves radiately ribbed. Perforation of lower valve moderate, firmly embracing and enclosing the plug.

abnormalis, *Sow.*
foliata, *Brod.*
rudis, *Brod.*

Sub-gen. MONIA, Gray (? Tedinia, Gray).

Shell with the surface of the valves radiately ribbed. Perforation of lower valve large, only slightly embracing the large thin plug.

Alope, *Gray*.
Cepio, *Gray*.
claviculata, *Cpr*.
Colon, *Gray*.
Ione, *Gray*.
macrochisma, *Desh*.
patelliformis, *Linn*.
pernoides, *Gray*.
Zealandica, *Gray*.

Genus PLACENTA, Retzius.

Shell semi-transparent, flat, sub-orbicular. Ridges of the hinge very gradually diverging from each other, the hinder ridge much the longer. Muscular scar rather in front of the middle of the hinge.

Ex. P. orbicularis, *Retzius*, pl. 129, fig. 3. Shell, P. orbicularis, fig. 3, *a*, 3, *b*.

The structure of the shell in this genus has been ascertained by Dr. Carpenter to consist of sub-nacreous, plicated, separable lamellæ, which are occasionally permeated by very minute tubuli. The single species described is from the coasts of India and China.

Genus PLACUNA, Solander.

Shell purplish, sub-opaque. Hinge-ridges rapidly diverging from one another at about the angle of forty-five degrees, of nearly equal length. Muscular scar under the centre of the hinge.

Ex. P. sella, *Gmelin*, pl. 129, fig. 4, 4, *a*.

The curious striated and bent-up "Saddle Oyster" (*P. sella*) is the best known of the species of this genus, which are but few in number, and inhabit the sandy shores of China, India, and Northern Australia.

Species of Placuna.

Lincolnii, *Gray*. sella, *Gmel*.
papyracea, *Lam*.

Fam. OSTREIDÆ.

Labial appendages triangular, connected around the mouth by a plain membrane; palps separate from the gills. Mantle entirely open, the edges double, and each bordered by short tentacular fringes; no conspicuous ocelli; branchial leaflets not doubled on themselves. Foot obsolete.

Shell irregular, foliated, free, or adherent. Ligament internal, or semi-internal. Muscular impression sub-central; pallial line entire.

Genus OSTREA, Linnæus.

Shell variously shaped, inequivalve, more or less inequilateral, often thick and irregular; upper valve most frequently flat or concave, under valve convex; surface foliated, or with radiating furrows. Hinge without teeth; ligament lodged in a pit in each valve, the beak behind that of the under valve, often produced, and exhibiting a furrowed ligamental area. Muscular scar sub-central; pallial impression obscure, entire.

Syn. Ostreum, *Adanson.* Amphidonta, *Fischer.* Peloris, *Poli.* Plagiostoma, *Sow.*

Ex. O. edulis, *Linnæus*, pl. 129, fig. 5. Shell, O. edulis, fig. 5, *a*, 5, *b*.

Oysters of different species appear to be found in most countries. The "Native Oyster" (*Ostrea edulis*) with which the London market is supplied, and those oysters so assiduously cultivated by the Chinese on the upright stones of their oyster preserves, and which are regularly collected when of a certain age, are remarkable for their flavour and delicacy, and are much sought as articles of food. The oysters of Venice, England, and the Dardanelles were well known to the luxurious Greeks and Romans of an ancient date, as are those of Colchester, Tenby, and Feversham to the English epicure of the present day.

Species of Ostrea.

Adriatica, *Lam.*
bicolor, *Hanley.*
borealis, *Lam.*
callochroa, *Hanley.*
Chemnitzii, *Hanley.*
circumsuta, *Gould.*
cochlear, *Poli.*
Columbiensis, *Hanley.*
conchaphila, *Cpr.*
cristata, *Born.*
Cumingiana, *Dkr.*
Cyrnusii, *Payr.*
deformis, *Lam.*
denticulata, *Born.*
discoidea, *Gould.*
edulis, *Linn.*
elliptica, *Lam.*
excavata, *Lam.*
fucorum, *Lam.*
gallina, *Lam.*
gibbosa, *Lam.*
glomerata, *Gould.*
haliotidea, *Lam.*
hippopus, *Lam.*
iridescens, *Gray.*
lacerata, *Hanley.*
margaritacea, *Lam.*
megadon, *Hanley.*
mytiloides, *Lam.*
mordax, *Gould.*

multistriata, *Hanley.*
numisma, *Lam.*
pes-tigris, *Hanley.*
pyxidata, *Adams and Reeve.*
rosacea, *Desh.*
rostralis, *Lam.*
ruscuriana, *Lam.*
scabra, *Lam.*
Senegalensis, *Gmel.*
sinuata, *Lam.*
spathulata, *Lam.*
spinosa, *Quoy.*
stentina, *Payr.*
trapezina, *Lam.*
tuberculata, *Lam.*
Virginica, *Gmel.*
Webbii, *Recluz.*

Sub-gen. LOPHA, Bolten (Alectryonia, *Fisch.* Dendrostrea, *Swains.*).

Shell plicate; margin of valves strongly dentate.

cornucopiæ, *Lam.*
crista-galli, *Linn.*
cucullata, *Born.*
frons, *Linn.*
Guineensis, *Dkr.*
hyotis, *Chem.*
imbricata, *Lam.*
labrella, *Lam.*
plicata, *Chem.*
turbinata, *Lam.*
Sinensis, *Gmel.*

Genus GRYPHÆA, Lamarck.

Shell free, inequivalve; inferior valve large, concave, beak prominent, incurved, ending in an involute spire; superior valve small, flat, opercular. Hinge toothless; cardinal fossa oblong, arcuated. Muscular impression single.

Ex. G. angulata, *Lamarck*, pl. 129, fig. 6, 6, *a*.

The fossil species of this genus are numerous; the only one that has been met with in the recent state is from the Philippines.

Class BRACHIOPODA.

Animal furnished with a pair of cirrhated arms or oral appendages, which are free or united by membrane, sometimes supported by calcareous processes. Mantle-lobes closely applied to the valves, fringed with horny *setæ*, and supplied with branching veins; gills none, respiration performed by the vessels of the mantle. Foot none.

Shell inequivalve, attached to submarine bodies by a muscular peduncle, or by the substance of its ventral valve; valves dorsal and ventral, united by muscles, and usually articulated by teeth.

Marine.

In this Class of Molluscous animals the most curious feature consists in the mouth being furnished with two folded or spiral labial appendages or oral arms, united by membrane, fringed with cirrhi, and supported by an internal shelly skeleton. In some of the genera the ends of the spiral arms are endowed with voluntary motion, the movement being effected by the injection of a fluid into the hollow spiral tube, by means of which the coils are separated. The arms, however, cannot be protruded from the shell, but are usually confined to one position by the membrane which unites them. Their nervous system, like that of other Mollusca, is composed of several medullary masses which surround the gullet and send filaments to the various organs of the body; their organs of taste, if they indeed

possess any, may be situated in the filaments of the mantle-margin, and those of touch, doubtless, consist of the curiously-twisted cirrhated arms or labial appendages. The Brachiopods appear to be altogether destitute of true gills, the function of respiration being performed by the vascular mantle, which is furnished for the purpose with numerous large, ramifying veins. Their digestive organs do not differ materially from those of the Bivalves, the alimentary canal commencing in a simple oral aperture situated between the bases of the contorted arms; in *Terebratula* it is tubular and curved for some distance, and then becomes dilated into a stomach, while in other genera it makes several turns, and continues throughout of the same calibre; there are no salivary glands, and the disintegrated liver pours its secretion directly into the digestive tube.

The mode in which the Brachiopod Mollusks are attached to foreign bodies varies in each family; the regular and deep-dwelling *Terebratulidæ* are anchored to sub-marine bodies by a tendinous peduncle which escapes through the perforated beak of the ventral valve which is also the upper valve, as these animals, like the Cirrhopods, repose upon their backs; in the horny, flattened *Discinidæ* the tendon of attachment passes through a fissure near the hind part of the under valve; in the singular *Lingulidæ*, which perforate the mud of shallow bays, the peduncle is tubular, and escapes from between the diverging beaks; the *Craniidæ*, which are sessile on stones and other submarine bodies, are directly attached by their flattened lower valve; while the *Thecideidæ*, which have the perforation in the beak rudimentary or closed, are fixed by the apex only of the lower valve.

The bodies of the Brachiopods are protected by two un-

equal, symmetrical valves united by a hinge, without a ligament, and opened and closed by means of special muscles which are attached to their inner surface, the office of the oral arms being confined to procuring and detaining their food. As these animals lie upon their backs, the lower valve is properly dorsal with reference to the body, while the upper, convex, and perforated valve must be regarded as ventral. In the *Terebratulidæ* the valves of the shell are calcareous and finely perforated, the tubular apertures being lined in the living animal with prolongations of the mantle; in the *Rhynchonellidæ* the structure of the shell is horny and imperforate; in the *Lingulidæ* it is thin and covered with an epidermis; in the *Orbiculidæ* it is nearly flexible and almost entirely horny; while the shells of the fossil *Productidæ* are generally spinulose; in the extinct tribe *Radiolitidæ* the texture of the lower valve is cellular; and in the *Hippuritidæ* the upper valve is pierced with pores which branch off towards the surface.

The characters of the various genera are principally taken from modifications of the peculiar, bony apophysary system, which is situated in the lower or dorsal valve, and which serves to support the cirrhated oral arms; two slender processes usually proceed from near the hinge-margin of the smaller imperforate valve and form loops or simple apophyses, and sometimes there is a central perpendicular lamina between them, to which the crura of the lateral processes are attached, either singly or doubly, and constitute a very complicated apparatus.

The existing species of Brachiopods are found in all latitudes, and appear to be most varied and abundant at considerable depths; their numbers, however, are few when compared with those of their fossil prototypes, which for-

merly swarmed at the bottom of the sea, and played a most important part among the molluscous population of those primeval deeps.

Fam. TEREBRATULIDÆ.

Animals always attached by a peduncle, furnished with cirrhated arms, united throughout by membrane, folded upon themselves, and only spiral at their extremities.

Shell minutely punctate, inequivalve, usually oval or subcircular, smooth or striated; ventral valve the larger, the beak produced and perforated at the apex; foramen separated from the hinge-line by a triangular plate or *deltidium* usually composed of two pieces; teeth supported by plates, one on each side of the deltidium; dorsal valve with a prominent cardinal process between the sockets for the teeth, a hinge plate with four cavities, and a central ridge or septum. Internal skeleton in the form of a slender shelly loop attached by its crura to the hinge-plate and furnished near its origin with oral processes.

The strongly cirrhated, looped or contorted oral arms fixed to a well-developed apophysary skeleton is the distinguishing characteristic of this family. The muscles which close the shell arise from the centre of the ventral valve, and are inserted at four points near the centre of the dorsal valve; besides these, there are retractor and peduncle muscles. The *Terebratulidæ* are all marine, and range from low-water to 100 fathoms; they are found in all seas.

Sub-fam. TEREBRATULINÆ.

Shell usually oval; valves convex, the margins entire or only slightly waved; hinge-line curved; beak of the larger

valve perforated, the foramen quite at the apex; deltidium of two pieces, often blended. Internal skeleton consisting of a slender shelly loop, not attached in the middle to the valve.

Genus TEREBRATULA, Llhwyd.

Shell usually oval and convex, smooth, ribbed, or marked with radiating striæ, the margins even or only slightly waved; foramen complete. Loop short and simple.

Syn. Epithyris, *King, not Phillips.* Gryphus, *Mühlf.* Lampas, *Humph.*

Ex. T. vitrea, *Born*, pl. 130, fig. 1. Shell, T. vitrea, fig. 1, *a*, 1, *b*.

In the genus *Terebratula*, as restricted, the loop is short and simple, formed of two riband-shaped lamellæ fixed to the crural base, and the oral processes do not unite to form a ring as in *Terebratulina*; the "*Terebratulæ* with long loops" of Davidson form the genus *Waldheimia* of King. The recent species are but very few in number.

Species of Terebratula.

pulvinata, *Gould.* vitrea, *Linn.*
uva, *Brod.*

Genus TEREBRATULINA, D'Orbigny.

Shell finely striated; valves auriculate; beak straight; deltidium rudimentary; foramen incomplete. Loop short, rendered annular by the union of the oral processes.

Ex. T. caput-serpentis, *Linnæus*, pl. 130, fig. 2. Shell, T. caput-serpentis, fig. 2, *a*, 2, *b*.

In this genus the crural processes are united, forming a shelly band behind the mouth of the animal, the reflected

border of the loop being always in front of the mouth; the beak is truncated; there are two ear-like expansions on the sides of the umbo; and the foramen is partly encircled by a deltidium united or disunited in different species.

Species of Terebratulina.

abyssicola, *Adams and Reeve.*
angusta, *Adams and Reeve.*
cancellata, *Koch.*
caput-serpentis, *Linn.*
Cumingii, *Davidson.*
Japonica, *Sow.*
septentrionalis, *Couth.*

Genus WALDHEIMIA, King.

Shell smooth or plicate; foramen complete. Loop elongated and reflected; central septum of the smaller valve elongated.

Ex. W. flavescens, *Lamarck*, pl. 130, fig. 3. Shell, W. flavescens, fig. 3, *a*, 3, *b*.

This genus, which is the same as the "*Terebratulæ* with long loops" of Davidson, differs from *Terebratella*, which it seems most to resemble, in the crura of the lateral appendages not being attached in their middle by processes to the central lamella.

Species of Waldheimia.

Californica, *Koch.*
caurina, *Gould.*
cranium, *Müll.*
dilatata, *Lam.*
flavescens, *Lam.*
globosa, *Lam.*
lenticularis, *Desh.*
Patagonica, *Gould.*
picta, *Chem.*
septigera, *Lovén.*

Sub-gen. EUDESIA, *King.*

Shell with the beak round; valves sharply plaited.

Grayii, *Davidson.*

Sub-fam. MAGASINÆ.

Shell smooth or radiately plaited; dorsal valve with a longitudinal depression; hinge-line straight or only slightly curved; area usually distinct; deltidium frequently incomplete. Loop attached to the septum of the dorsal valve.

Genus TEREBRATELLA, D'Orbigny.

Shell with the loop elongated, reflected, doubly attached, once to the hinge-plate and again to the longitudinal septum, by processes given off at right angles from the crura near the centre of the valve.

Syn. Delthyris, *Mke.*

Ex. T. dorsata, *Gmelin*, pl. 130, fig. 4, 4, *a.*

In this genus the loop is long and doubled upon itself as in *Waldheimia*, but the crura give off about their middle a flat, wide, horizontal process which is affixed to the elevated, longitudinal, central septum; there are fourteen recent species of *Terebratella* described, from all parts of the world. In the sub-genus *Waltonia*, which is founded on a single minute specimen, the reflexed portion of the loop is wanting, but this may possibly have been broken away.

Species of Terebratella.

Bouchardii, *Davidson.*
Chilensis, *Brod.*
Coreanica, *Adams and Reeve.*
cruenta, *Dillw.*
dorsata, *Gmel*
flexuosa, *King.*
frontalis, *Midd.*
Labradorensis, *Sow.*
rubella, *Sow.*
rubicunda, *Sow.*

sanguinea, *Chem.*
Sowerbii, *King.*
Spitzbergensis, *Davidson.*
transversa, *Sow.*

Sub-gen. WALTONIA, Davidson.

Shell with the beak truncated by a large incomplete foramen; deltidia separate. Loop reduced to two simple lamellæ furnished with oral processes and attached to a prominent central septum.

Valenciennii, *Davidson.*

Genus MAGAS, Sowerby.

Shell with a reflected loop attached near the bend to a very prominent central septum.

Ex. M. Cumingii, *Davidson*, pl. 131, fig. 1, 1, *a*.

In this genus the apophysary system is composed of an elevated longitudinal septum with two pairs of calcareous lamellæ; the lower pair, riband-shaped, proceed from their attachment to the crural base by a gentle curve to near the front part of the septum; the second pair extend in the form of two triangular lamellæ from either side of the upper edge of the septum.

Species of Magas.

crenulata, *Sow.*
Cumingii, *Davidson.*
Evansii, *Davidson.*

Genus BOUCHARDIA, Davidson.

Shell with a minute foramen at the apex of the beak; deltidium solid. Apophysis anchor-shaped, the central septum being furnished with two short lamellæ.

Ex. B. tulipa, *Blainville*, pl. 131, fig. 2, 2, *a*.

In this genus the apophysary system is anchor-shaped, consisting of an elevated central plate, to which are affixed two short lamellæ; a single species only is known, dredged at Rio in thirteen fathoms by J. Macgillivray.

Genus MEGERLIA, King.

Shell transversely oblong, with a wide and rather straight hinge-line; area distinct; foramen incomplete. Loop rather short, reflected, triply attached, once to the hinge-plate and twice to the septum, by processes from the crura and also from the reflected portion of the loop.

Syn. Kingena, *Davidson.* Ismenia, *King.*

Ex. M. truncata, *Linnæus*, pl. 131, fig. 3. Shell, M. truncata, fig. 3, *a*, 3, b.

In this genus two short, central, diverging branches arise from the extremity of the longitudinal septum and support the calcareous loop, the riband-shaped lamellæ of which, first attached to the crural base, afterwards become fixed to the diverging branches of the septum, and then proceed nearly parallel to one another until they form a reflexed loop, which also gives off two processes which affix themselves to the median crest.

Species of Megerlia.

pulchella, *Sow.* truncata, *Linn.*

Genus KRAUSSIA, Davidson.

Shell sub-circular, with a nearly straight hinge-line; beak truncated, laterally keeled; foramen large and round; deltidia small, disunited; hinge-area flat; dorsal valve

longitudinally depressed, Internal skeleton consisting of a small forked process arising from the septum near the centre of the valve.

Ex. K. Lamarckiana, *Davidson*, pl. 131, fig. 4. Shell, K. pisum, *Valenciennes*, fig. 4, *a*, 4, *b*.

The inferior peduncle muscles in this genus are large, and leave two wide impressions close to the hinge. The mesial ridge or septum extends to about half the length of the dorsal valve, and the two small forked lamellæ which arise from its extremity diverge and are expanded at their ends.

Species of Kraussia.

Capensis, *Adams and Reeve.*
cognata, *Chem.*
Lamarckiana, *Davidson.*
pisum, *Lam.*
rubra, *Pallas.*

Genus MORRISIA, Davidson.

Shell coarsely punctate, with a large foramen encroaching equally on both valves; ventral valve with a small straight area. Loop not reflected, united to a small forked process in the centre of the valve.

Ex. M. anomioides, *Scacchi*, pl. 131, fig. 5. Shell, M. anomioides, fig. 5, *a*, 5, *b*.

The animal of *Morrisia* is furnished with two sub-spiral or sigmoid arms with comparatively large cirrhi, which, supported by the crural processes, pass forwards and, converging in front of the mouth, again turn outwards. The shell is minute, circular, and depressed; the deltidia are very small and widely separated; the dorsal or smaller valve is deeply notched at the umbo; and the apophysary system consists of

two branches, not reflexed, and united to a small central process arising from the centre of the valve.

Species of Morrisia.

anomioides, *Scacchi.* lunifera, *Phil.*

Fam. THECIDEIDÆ.

Animal with the oral arms folded upon themselves, united by membrane, fringed with long cirrhi on their outer margins, and supported by a complicated shelly loop. Mantle extending to the margin of the valves and closely adherent, the margin simple, not ciliated.

Genus ARGIOPE, Deslongchamps.

Shell transversely oblong or semicircular, smooth or radiately ribbed, strongly punctate; hinge-line wide; foramen large and rounded; area flat, triangular; deltidium rudimentary; dorsal valve depressed, interior furnished with one or more prominent sub-marginal septa; ventral valve truncated at the beak. Loop originating at the base of the dental sockets and folded into two or more lobes occupying the interspaces of the radiating septa to which they adhere on their inner sides.

Syn. Megathyris, *D'Orb.*

Ex. A. decollata, *Chemnitz*, pl. 131, fig. 6. Shell, A. decollata, fig. 6, *a*, 6, *b*.

In *Argiope* the animal is attached by a tendon passing out of the very large perforation below the truncated beak of the ventral valve. The oral arms, united by membrane, form a disk, and are folded so as to form four, or, as in the sub-genus *Cistella*, only two lobes.

Sub-gen. CISTELLA, Gray.

Shell with the loop two-lobed.

cistellula, *Searles Wood.* Neapolitana, *Scacchi.*
cuneata, *Risso.*

Genus THECIDEA, Defrance.

Shell thick, rounded or oval, more or less regular, punctate, attached by the umbo of the ventral valve, or free; ventral valve with the umbo rather produced and perforated by a minute apical foramen usually closed at an early age; hinge-area flat, triangular; deltidium triangular, scarcely distinct from the area; interior deeply concave, furnished with two prominent cardinal teeth, the surface striated and marked with three muscular scars; dorsal valve small, rounded, opercular, furnished interiorly with a prominent cardinal process between the dental sockets. Oral processes united, forming a bridge over the visceral cavity, separating the oral from the anal orifice; disk grooved for the reception of the loop, the grooves separated by branches from a central septum; loop often unsymmetrical, divided into two or more lobes, united more or less intimately with the sides of the grooves.

Syn. Thecidium, *Sowerby.*

Ex. T. Mediterranea, *Risso*, pl. 132, fig. 1. Shell, T. Mediterranea, fig. 1, *a*, 1 *b*.

In the genus *Thecidea* the shell is attached by the truncated apex of the dorsal valve, or it is free, when the apex is produced and entire. The calcareous loop is folded into two or more lobes, which repose in hollows of corresponding form excavated in the substance of the smaller valve.

Fam. RHYNCHONELLIDÆ.

Oral arms elongate, fleshy, spiral, supported at the base by two short, curved, shelly, diverging laminæ arising from the hinge-margin of the ventral valve.

Shell not punctate, usually tetrahedral and sharply plicate; the interior without any shelly plates or cartilaginous or testaceous skeleton.

In this family the spirally convoluted buccal appendages or oral arms are not supported by any internal apophysary system, the substance of the shell is not punctate, and its surface is generally plaited.

Genus RHYNCHONELLA, Fischer.

Shell tumid, thin, variable in shape; beak of upper or ventral valve acute, entire, more or less recurved; no true area; foramen triangular and open, placed under the beak, reaching the margin. Apophysary system consisting of two separate, curved, moderately developed, shelly blades projecting from the hinge of the lower or dorsal valve.

Syn. Hypothyris, *Phillips*. Hermithyris, *D'Orb.*

Ex. R. psittacea, *Chemnitz*, pl. 132, fig. 2. Shell, R. psittacea, fig. 2, *a*, 2, *b*.

The shell in this genus is never punctate, and the free, fleshy, spiral arms are affixed to two short, flattened, and grooved lamellæ, separated from each other, slightly curved upwards, and attached to the inner side of the beak of the small dorsal or imperforate valve. Three recent species are known; *R. psittacea* is from the northern and arctic seas, and *R. nigricans* is from the shores of New Zealand.

Species of Rhynchonella.

Grayi, *Woodw.* psittacea, *Chem.*
nigricans, *Sow.*

Fam. CRANIIDÆ.

Animal with its oral arms fixed to a process of the lower or ventral valve.

Shell calcareous, minutely tubular, attached to marine bodies by the outer surface of the ventral valve which is imperforate; upper or dorsal valve simple, conical. Hinge and apophysary system wanting.

This family differs from *Discinidæ* in the calcareous structure of the shell and in the ventral valve being entire and attached by its outer surface. The position of the animal on its ventral side is, however, the same as in that family.

Genus CRANIA, Retzius.

Shell calcareous, tubular, without hinge or internal calcareous appendages; ventral or fixed valve not perforated for the passage of a peduncle of attachment, the interior with a central process to which the fleshy spiral arms are attached; dorsal or upper valve free, limpet-like, with two diverging muscular processes.

Syn. Criopus, Criopoderma, *Poli.* Cryopus, *Desh.* Craniolithes, *Schloth.* Orbicula, *Cuv.* Discina, *Turt.*, not *Lam.*

Ex. C. anomala, *Müller*, pl. 132, fig. 3. Shell, C. anomala, fig. 3, *a*, 3, *b*.

The species of *Crania* inhabit deep water, and are found in India, New South Wales, the Mediterranean, Britain, and Spitzbergen.

Species of Crania.

anomala, *Müll.*
personata, *Lam.*
radiosa, *Gould.*
ringens, *Hæningh.*
rostrata, *Hæningh.*

Fam. DISCINIDÆ.

Animal with its oral arms fixed to a process of the lower or ventral valve.

Shell horny, minutely tubular, attached to marine bodies by a short tendinous peduncle which passes through a fissure in the hinder part of the ventral valve; upper or dorsal valve conical and patelloid. No hinge or apophysary system.

If the lower valve in these animals corresponds to the perforated valve of the *Terebratulidæ*, the oral arms will be fixed to the ventral instead of to the dorsal valve, so that they cannot be said to repose on their backs like most other Brachiopods.

Genus DISCINA, Lamarck.

Shell horny, orbicular; upper valve conical, limpet-like, without any internal processes; lower or ventral valve perforated near the hind part for the passage of the peduncle, and furnished internally with a central process for the attachment of the ciliated arms.

Syn. Orbicula, *Sow.*, not *Cuv.*

Ex. D. lamellosa, *Broderip*, pl. 132, fig. 4. Shell, D. lamellosa, fig. 4, *a*, 4, *b*.

The shell in this genus is horny, and when moist and

recent is quite flexible; the species are chiefly from the coast of South America.

Species of Discina.

Cumingii, *Brod.*
Evansii, *Davidson.*
lævis, *Sow.*
lamellosa, *Brod.*
striata, *Sow.*
strigata, *Brod.*
tenuis, *Sow.*

Fam. LINGULIDÆ.

Animal with the oral arms elongated, fleshy, sub-spiral, fringed externally with numerous cirrhi, and situated on each side of the mouth. Mantle with rudimentary branchiæ.

Shell nearly equivalve, hingeless, thin, horny, elongate, supported by a thick peduncle which comes out between the diverging beaks.

These animals are found perforating the mud of shallow bays, or living in sand or sandy mud in harbours. The shells are covered with a horny epidermis.

Genus LINGULA, Bruguière.

Shell thin, depressed, almost equivalve, hingeless, the valves held together by the adductor muscles, covered with an epidermis, and attached by a peduncle which passes between the beaks; interior with no calcareous supports or appendages.

Syn. Pharetra, *Bolt.*, not *Hubn.* Ligula, *Cuv.*, not *Leach* or *Bloch.*

Ex. L. anatina, *Lamarck*, pl. 132, fig. 5. Shell, L. anatina, fig. 5, *a*.

The species of this genus are from the Philippine islands, West Columbia, California, and the Sandwich islands; in some the shells are almost entirely cartilaginous.

Species of Lingula.

albida, *Hinds.*
anatina, *Lam.*
Audebardi, *Brod.*
hians, *Swains.*
ovalis, *Reeve.*
semen, *Brod.*
tumida, *Reeve.*

Class TUNICATA.

Acephalous Mollusks with a soft, organized, coriaceous or gelatinous shell or test provided with a branchial and an anal orifice. Mantle forming an interior coat. Gills attached wholly or partly to the internal surface of the mantle. Mouth without labial tentacles, placed below the gills. Animals single or aggregate, fixed or free, hermaphrodite, undergoing a metamorphosis in their young state.

The Tunicaries are entirely marine, and are very numerous in all parts of the world; adhering to rocks and seaweed, their strange, bag-shaped, leathery bodies may be seen along the strand at low-water, ejecting, when touched, the sea-water to some distance; and on the ocean their lengthened sinuous chains, or pellucid phosphorescent tubes cannot fail to arrest the eye of the voyager. The compound forms exhibit, in the varied arrangement of the individuals composing the general mass, a number of elegant stars and flowers of curious and complicated design. Towards the northern shores they are sombre in their colours, but in the sunny regions of the south their hues assume the brightest dyes, and vie with those of the corallines and *Actiniæ* that people the bed of the ocean. It was in the Ascidian Tunicaries that MM. Audouin and Milne-Edwards first discovered the metamorphoses of the Mollusca,

and their discoveries have been since extended by the laborious researches of Sars and Lovén.

It was among these singular beings that Van Hasselt discovered "a heart of such extraordinary character, changing incessantly its auricle to ventricle, and its ventricle to auricle, its arteries to veins, and its veins to arteries." Among the Salpian Tunicaries it was, moreover, that Chamisso made the no less extraordinary discovery that "a *Salpa*-mother is not like its daughter or its own mother, but resembles its sister, its granddaughter, and its grandmother." The Pyrosomes afford a spectacle to the naturalist of unexampled beauty when, seen by myriads from the vessel in the night, they gleam with phosphorescent radiance, forming vast shoals of mimic pillars of fire, illuminating all around with a green unearthly glare. The most curious feature, however, in the history of these soft-shelled Mollusks is the fact that many among them form communities of beings like the Corals, "a commonwealth of beings bound together by common and vital ties. Each star is a family, each group of stars a community. Individuals are linked together in systems, systems combined into masses." All the Tunicaries are free in their young or larval state, but afterwards become fixed to rocks, algæ, shells, and other marine bodies; some, however, as the Salpians and Pyrosomes, remain always free, floating in the water.

The Tunicaries have certain affinities with the *Bryozoa*, but their closest relationship seems to be with the other Acephalous Mollusca with calcareous shells. "Were the test of an Ascidian," says Professor E. Forbes, "converted into a hard shell, symmetrically divided into two plates, connected together dorsally by cartilage, and capable of

separation, so as to expose the mantle along a ventral mesial line, whilst the orifices protruded at one extremity, it would present the closest similarity with many bivalve Molluscs." The gills in these animals have generally the form of ridges more or less complicated and seldom symmetrical, and their digestive, reproductive, and circulatory organs are tolerably complicated, and disposed at the base of their sac-like bodies.

Fam. ASCIDIIDÆ.

Body sacciform, gelatinous or coriaceous, fixed at one extremity, free at the other, with two more or less prominent orifices, a branchial and an anal; branchial sac simple or plicate. Not united into groups by a common integument; solitary or gregarious. Oviparous. Sexes united.

In the genera *Ascidium* and *Molgula* the gills are not plicated, which is the case in the other genera. *Cynthia* and *Chelyosoma* are sessile, while *Boltenia* and *Cystingia* are pedunculated. On the coasts of the Channel and the Mediterranean, and in the China seas some of the species of these isolated Tunicaries are valued as articles of food. "At Cette," says Van Beneden, "*Ascidia* are taken regularly to market, and *Cynthia microcosmus*, although so repulsive externally, furnishes a very delicate morsel, much sought after by some."

Genus ASCIDIUM, Baster.

Body sessile, covered with a coriaceous or gelatinous tunic; branchial orifice eight-lobed, furnished inside with a

circle of tentacular filaments, anal orifice six-lobed; branchial sac not plicated, the meshes papillated.

Syn. Ascidia, *Linnæus.* Phallusia, Ciona, Pirena, *Savigny.* Alina, *Risso.* ? Mammaria, *O. F. Müller.*

Ex. A. mentula, *O. F. Müller*, pl. 133, fig. 1.

The *Ascidia* are frequently found attached to the under surface of rough stones on the shore at low-water in various parts of the world. "They are variously and often splendidly coloured, but otherwise unattractive or even repulsive in aspect. Numbers of them are often found clustering among tangles, like bunches of some strange semi-transparent fruit." (Forbes.)

Species of Ascidium.

amphora, *Agass.*
arachnoïdeum, *Forbes.*
aspersum, *Müller.*
callosum, *Stimp.*
caninum, *Müller.*
carneum, *Agass.*
conchilega, *Müller.*
echinatum, *Linn.*
geometricum, *Stimp.*
hirsutum, *Agass.*
intestinale, *Linn.*
mentula, *Müller.*
monachus, *Cuv.*
monstrans, *Gould.*
ocellatum, *Agass.*
orbiculare, *Müller.*
papilla, *Dalyell.*
paralellogramma, *Müller.*
prunum, *Müller.*
psammophorum, *Agass.*
rugosum, *Agass.*
rusticum, *Dalyell.*
scabrum, *Müller.*
tenellum, *Stimp.*
turcica, *Sav.*
venosum, *Müller.*
villosum, *Dalyell.*
violacea, *Gould.*
virgineum, *Müller.*
vitreum, *Van Ben.*

Genus MOLGULA, Forbes.

Body more or less globular, attached or free; test membranous, usually invested with extraneous matter; orifices

on very contractile, naked tubes, the oral six-lobed, the anal four-lobed.

Ex. M. arenosa, *Alder and Hancock*, pl. 133, fig. 2.

The species of *Molgula* have been found between tide-marks in the laminarian zone, and as deep as twenty-five fathoms. The surface is usually covered with particles of sand and other substances. Except in the number of lobes of the oral aperture, *Glandula* of Stimpson does not seem to differ from this genus.

Species of Molgula.

arenata, *Stimp.*
arenosa, *Ald. and Hanc.*
oculata, *Forbes.*
producta, *Stimp.*
tubulosa, *Rathke.*

Sub-gen. GLANDULA, Stimpson.

Branchial orifice with four lobes, the anal square; branchial sac with a few distant plications.

fibrosa, *Stimp.*
mollis, *Stimp.*

Genus CYNTHIA, Savigny.

Body sessile, covered with a coriaceous tunic; oral and anal orifices four-lobed; branchial sac longitudinally plicated, surmounted by a circle of tentacular filaments; meshes of respiratory tissue not furnished with papillæ. Ovaries usually two.

Syn. Stycla, Cæsira, *Savigny*. ? Fodia, *Bosc.*

Ex. C. morus, *Forbes*, pl. 133, fig. 3.

The species range from low-water to thirty fathoms. They are frequently found associated in groups of numerous individuals, and their tests, even in the same species, are often variously coloured. The sub-genus ***Dendrodoa*** closely agrees with *Cynthia* in its branchial reticulations and its digestive apparatus, but of the two ovaries possessed by *Cynthia*, only one, and that the left, is found in ***Dendrodoa***, whilst the right ovary alone is present in ***Pandocia***. In the form *Pera* of Stimpson the oral orifice is six-lobed and the anal four-lobed.

Species of Cynthia.

aggregata, *Rathke.*
amphora, *Gould.*
ampulla, *Brug.*
Canopus, *Sav.*
claudicans, *Sav.*
Dione, *Sav.*
grossularia, *Van Ben.*
gutta, *Stimp.*
informis, *Forbes.*
limacina, *Forbes.*
mamillaris, *Pallas.*
microcosmus, *Sav.*
morus, ***Forbes.***
papillosa, ***Linn.***
partita, *Stimp.*
polycarpa, ***Sav.***
pomaria, ***Sav.***
quadrangularis, ***Forbes.***
quadridentata, ***Sav.***
rustica, ***Linn.***
subcærulea, ***Stimp.***
tessellata, ***Forbes.***
tuberosa, ***Macgilliv.***
vittata, *Stimp.*

Sub-gen. DENDRODOA, Mac Leay.

Body sub-cylindrical, sessile; test smooth, coriaceous; orifices terminal, minute, indistinctly qudarifid. Ovary single, on the left side.

glandaria, *Mac Leay.*

Sub-gen. PANDOCIA, Savigny.

Animal as in *Cynthia*, but the right ovary only developed.

mytiligera, *Sav.*

Sub-gen. PERA, Stimpson.

Body pyriform, adhering by a very small base; test gelatinous; orifices sessile, the branchial six-lobed, the anal four-lobed; branchial sac plicated.

pellucida, *Stimp.*

Genus PELONAIA, Forbes and Goodsir.

Test cylindrical; orifices terminal, four-cleft, on two small, approximated, papillose eminences; mantle adherent to the test; no tentacles. Ovaries two, symmetrical.

Ex. P. corrugata, *Forbes and Goodsir*, pl. 133, fig. 4.

This genus, in its cylindrical body and terminal orifices, resembles *Siphunculus* among the Echinoderms. They have relations also with the *Annulosa* in the transverse plaits of the respiratory sac and in being bi-lateral. One of their most striking peculiarities is the perfect union of the test and the mantle. The *Pelonaiæ* live buried in mud, quite unattached to any other body, and are extremely apathetic animals, presenting scarcely any appearance of motion.

Species of Pelonaia.

corrugata, *Forbes and Goodsir.* glabra, *Forbes and Goodsir.*

Genus CHELYOSOMA, Broderip and Sowerby.

Body depressed, oblong, fixed, sessile; test coriaceous, its upper surface consisting of eight somewhat horny, angular plates; orifices small, prominent, perforating the plaited surface, each surrounded by six triangular valves; gills plicated; tentacles simple.

Ex. C. Macleayanum, *Broderip and Sowerby*, pl. 133, fig. 5.

These are curious tortoise-like Ascidians from the shores of Greenland. A single species only has hitherto been discovered.

Genus BOLTENIA, Savigny.

Body more or less globular, fixed, pedunculated; test coriaceous; orifices lateral, each cleft into four rays; branchial sac longitudinally plicated, surmounted by a circle of compound tentacula.

Syn. Bipapillaria, *Peron.*

Ex. B. reniformis, *Mac Leay*, pl. 133, fig. 6.

Sometimes one *Boltenia* is attached to the stem of another individual. One species, *B. reniformis*, is an inhabitant of the Arctic seas, living attached to stones in deep water. The sub-genus *Cystingia* is also found in the Northern seas.

Species of Boltenia.

coacta, *Gould.*
microsoma, *Agass.*
ovifera, *Linn.*
pedunculata, *Sav.*
reniformis, *Mac Leay.*
rubra, *Stimp.*

Sub-gen. CYSTINGIA, Mac Leay.

Body globular; test sub-coriaceous; anal orifice irregular, terminal.

Griffithsii, *Mac Leay.*

Fam. CLAVELLINIDÆ.

Individuals each having its own heart, respiration, and system of nutrition, but fixed on peduncles that branch from a common stem, through which the blood circulates in opposite directions.

Genus CLAVELLINA, Savigny.

Individuals connected by creeping tubular prolongations of the common tunic. Body elongated, erect, more or less pedunculated; test smooth and transparent; thoracic region usually marked with coloured lines; anal and oral orifices without rays.

Syn. Rhopalea, *Philippi.*

Ex. C. lepadiformis, *O. F. Müller*, pl. 133, fig. 7.

These are small, transparent, compound Ascidians found adhering to stones and sea-weed by means of curious root-like prolongations of their outer tunic, by which a circulation is kept up common to the entire community. They are found in Great Britain, Greenland, and the Mediterranean.

Genus PEROPHORA, Wiegmann.

Individuals pedunculated, sub-orbicular, compressed, tached by their peduncles to creeping tubular processes the common tunic, through which the blood circulat thoracic region plain, not lineated by granular bands.

Ex. P. Listeri, *Wiegman*, pl. 133, fig. 8.

The only species of *Perophora* known inhabits the I tish coasts. It occurs in groups consisting of several ir viduals, each having its own heart, respiration, and syst of nutrition, but fixed on a peduncle that branches fron common creeping stem, and all being connected by a cir lation that extends throughout (Lister).

Genus SYNTETHYS, Forbes and Goodsir.

Animals compound, gelatinous, orbicular, sessile. In viduals very prominent, arranged sub-concentrically in common mass; branchial and anal orifices simple, not into rays.

Ex. S. Hebridicus, *Forbes and Goodsir*, pl. 133, fig. Individual, S. Hebridicus, fig. 9, *a*.

Syntethys is a *Clavellina* with the habit of a *Diazon* The only known species forms compact, greenish, transl cent, gelatinous masses of half a foot in diameter and near equal height, affixed to rocks or stones by a short bas The individual Ascidians are, when full grown, two inch in length (Forbes).

Fam. BOTRYLLIDÆ.

Animals compound, fixed, adhering by their sides in a greater or less number, so as to resemble a single complex animal. Each individual with distinct branchial and anal orifices, and not connected by any internal union. Oviparous and gemmiparous.

Sub-fam. BOTRYLLINÆ.

Individuals united in systems around common excretory cavities. Thoracic and abdominal regions not distinct, the viscera being pushed forward on the side of the branchial cavity, and forming with the thorax an ovoid mass.

Genus BOTRYLLUS, Gaertner.

Test irregular, gelatinous, formed of numerous systems arranged in simple stars. Individuals horizontal, with the vent far from the branchial orifice; branchial orifices simple, ranged round a common *cloaca*.

Syn. Alcyonium, *Auct.* Polycyclus, *Lam.* Pyura, *Blainv.*

Ex. B. polycyclus, *Savigny*, pl. 134, fig. 1. Individual, B. polycyclus, fig. 1, *a*.

In this genus the tests of the animals are fixed together, forming a common mass in which the animals are imbedded in one or more groups or systems, but the individuals are not connected by any internal union. The species vary considerably in form and colour, being purple, yellow, blue, grey, or green.

Species of Botryllus.

aureus, *Löw. and Kolliker.*
bivittatus, *Milne-Edw.*
gemmeus, *Sav.*
polyclyclus, *Sav.*
Schlosseri, *Pallas.*
smaragdus, *Milne-Edw.*
verrucosus, *Dalyell.*
violaceus, *Milne-Edw.*

Genus BOTRYLLOIDES, Milne-Edwards.

Stars formed by the systems composing the common mass irregular and ramifying. Individuals placed vertically in linear series; branchial and anal orifices closely approximated.

Ex. B. rotifer, *Milne-Edwards*, pl. 134, fig. 2. Individual, B. rotifer, fig. 2, *a*.

The *cloacæ* in this genus are prolonged into the common mass as internal, irregular channels, on each side of which the individuals are placed in linear series, instead of having a simple star-like arrangement around the *cloaca* as in *Botryllus*. The animals, moreover, have a nearly vertical position, and their orifices are closely approximate.

Species of Botrylloides.

albicans, *Milne-Edw.*
aureus, *Sav.*
Leachii, *Sav.*
rotifer, *Milne-Edw.*
ruber, *Milne-Edw.*

Sub-fam. POLYCLININÆ.

Body divided into three distinct portions; a thorax with the branchial apparatus; a superior abdomen with the digestive organs; and a post-abdomen with the heart and reproductive organs.

Genus POLYCLINUM, Savigny.

Test gelatinous or cartilaginous, polymorphous, sessile or slightly pedunculate; systems numerous, convex, radiated, each with a central cloacal cavity. Individuals placed at unequal distances from a common centre; abdomen much smaller than thorax; post-abdomen pedunculate; branchial orifice six-angled and six-rayed, anal prolonged horizontally and irregularly cut.

Ex. P. aurantium, *Milne-Edwards*, pl. 134, fig. 3. Individual, P. aurantium, fig. 3, *a*.

There are about seven species, inhabiting the shores of Britain, the Mediterranean, the Red Sea, and India.

Species of Polyclinum.

aurantium, *Milne-Edw.*
constellatum, *Sav.*
cythereum, *Sav.*
hesperium, *Sav.*
isiacum, *Sav.*
saturnium, *Sav.*
uranium, *Sav.*

Genus APLIDIUM, Savigny.

Test gelatinous or cartilaginous, sessile; systems numerous, prominent, without central cavities. Individuals placed in single rows, at equal distances from the centres; branchial orifice six-rayed, anal simple, indistinct.

Syn. Alcyonium, part, *Auct.* Polycitor, part, *Renieri.*

Ex. A. fallax, *Johnston*, pl. 134, fig. 4. Individual, A. lobatum, *Savigny*, fig. 4, *a*.

The species of *Aplidium* are usually found attached to stones, &c., in deep water. They are met with on the coasts of Europe and the Red Sea.

Species of Aplidium.

chrystallinum, *Renieri.*
fallax, *Johnston.*
ficus, *Linn.*
gibbosulum, *Löw. and Kolliker.*
lobatum, *Sav.*
nutans, *Johnston.*

Genus SIDNYUM, Savigny.

Test gelatinous, incrusting; systems numerous, conical, truncated and starred at the summit. Individuals arranged round a depressed centre; branchial orifice eight-toothed, anal simple, tubular, folded against the thorax. Ovary pedunculate.

Ex. S. turbinatum, *Savigny*, pl. 134, fig. 5. Individual, S. turbinatum, fig. 5, *a.*

The animals of *Sidnyum* partake of the characters of *Synoicum* and *Aplidium*, resembling the former in the structure of their stomach, and the latter in their branchial apparatus. Each has an eight-toothed branchial orifice, and a simple tubular vent folded against the thorax. The ovary is pedunculated, and very conspicuous at the extremity of the animal.

Genus SYNOICUM, Phipps.

Test semi-cartilaginous, cylindrical, pedunculate, isolated or gregarious; systems single, circular, terminal. Individuals six to nine; branchial orifice six-rayed, anal orifice with six unequal rays, the largest three forming the outer margin of the central star; post abdomen sessile.

Ex. S. turgens, *Phipps*, pl. 131, fig. 6. Individual, S. turgens, fig. 6, *a.*

The only species of this genus at present known is from the Arctic seas.

Genus AMOUROUCIUM, Milne-Edwards.

Test fleshy or coriaceous, incrusting, sessile or pedunculated, polymorphous; systems numerous, each with a central cavity. Individuals grouped at unequal distances round the common centre; anal orifice opening into a common *cloaca*, branchial orifice six-rayed; abdominal divisions indistinct.

Syn. Polycitor, part, *Renieri.*

Ex. A. Argus, *Milne-Edwards*, pl. 135, fig. 1. Individual, A. Argus, fig. 1, *a.*

This genus resembles *Aplidium* and *Synoicum* in the general form of the animal, and *Polyclinum* in the presence of a central common cavity to each system.

Species of Amouroucium.

Argus, *Milne-Edw.*
conicum, *Renieri.*
incrustatum, *Sav.*
mutabile, *Sav.*
Nordmanni, *Löw. and Kolliker.*
pomum, *Sav.*
proliferum, *Milne-Edw.*

Sub-gen. PARASCIDIUM, Milne-Edwards.

Oral openings eight-lobed, each accompanied by two oculiform points.

flavum, *Milne-Edw.*

Genus SIGILLINA, Savigny.

Test gelatinous, solid, elongated, erect, pedunculate, solitary or gregarious; systems single, of many individuals disposed one above another in irregular circles; branchial and anal orifices each with six rays; abdomen larger than thorax; post-abdomen long and slender.

Ex. S. australis, *Savigny*, pl. 135, fig. 2. Individual S. australis, fig. 2, *a*.

A single species only of this curious form is at present known, from the shores of tropical seas. The name is derived from *Sigillum*, from a supposed resemblance of the common mass to a seal.

Sub-fam. DIDEMNIINÆ.

Body distinctly divided into two parts, thorax and abdomen.

Genus DIDEMNIUM, Savigny.

Test coriaceous, polymorphous, sessile, and incrusting; systems numerous, compressed, without central cavities or distinct circumscription. Individuals scattered; abdomen pedunculate. Ovary placed by the side of the intestinal loop, increasing in length when the eggs are fully developed.

Ex. D. candidum, *Savigny*, pl. 135, fig. 3. Individual, D. candidum, fig. 3, *a*.

The Tunicaries composing the systems of individuals in this genus are without any appreciable order of arrangement, and are scattered over the common body. The species are found in the European seas.

Species of Didemnium

candidum, *Sav.*
gelatinosum, *Sav.*
roseum, *Sav.*

Genus DISTOMUS, Gaertner.

Test semi-cartilaginous, sessile, polymorphous; systems numerous, usually circular. Tunicaries arranged in one or more ranks, at unequal distances from a common centre; anal and branchial orifices regularly and equally six-rayed.

Syn. Polyzona, *Fleming.*

Ex. D. ruber, *Savigny*, pl. 135, fig. 4. Individual, D. ruber, fig. 4, *a*.

This genus and the following, *Diazona*, belong to the bi-stellate Didemnians, in which both orifices are rayed; in the other genera the oral orifice only is rayed. Species are found in Europe, South Africa, and Australia.

Species of Distomus.

fuscus, *Sav.*
ruber, *Sav.*
variolosus, *Gaertn.*
vitreus, *Sav.*

Genus DIAZONA, Savigny.

Test gelatinous, orbicular, sessile or sub-pedunculate; system single. Tunicaries very prominent, arranged in concentric circles on an expanded flower-like disc; branchial and anal orifices six-rayed; abdomen pedunculate. Ovary inclosed in the intestinal loop.

Ex. D. violacea, *Savigny*, pl. 135, fig. 5. Individual, D. violacea, fig. 5, *a*.

One species only of this genus has been described, from the Mediterranean.

Genus EUCŒLIUM, Savigny.

Test gelatinous, sessile, and incrusting; systems numerous, without central cavities or distinct circumscription. Tunicaries sometimes scattered, sometimes arranged in a quincunx; branchial orifice circular, without distinct rays, anal orifice very minute; abdominal viscera pushed up by the side of the thorax.

Ex. E. hospitiolum, *Savigny*, pl. 135, fig. 6. Individual, E. hospitiolum, fig. 6, *a*.

A single species only of this genus is known, inhabiting the shores of Europe.

Genus LEPTOCLINUM, Milne-Edwards.

Test thin, sessile, incrusting, polymorphous; systems numerous. Individuals grouped irregularly round common cloacal cavities, more or less ramified; branchial orifice six-lobed; abdomen pedunculate, short, smaller than the thorax.

Ex. L. gelatinosum, *Milne-Edwards*, pl. 136, fig. 1. Individual, L. gelatinosum, fig. 1, *a*.

There are six species of this genus peculiar to Britain and the seas of Europe. They are variously coloured, and are usually found adhering to the roots of *Laminariæ*.

Species of Leptoclinum.

asperum, *Milne-Edw.*
aureum, *Milne-Edw.*
clavatum, *Sav.*
gelatinosum, *Milne-Edw.*
Listerianum, *Milne-Edw.*
lividum, *Sav.*
maculosum, *Milne Edw.*
punctatum, *Forbes.*

Fam. PYROSOMATIDÆ.

Common body semi-cartilaginous, floating, cylindrical, bearing externally numerous pointed tunicaries, hollow and mamillated within, and open at one of its extremities only. Tunicaries associated in a verticillate arrangement, having two orifices, one at each extremity.

The Pyrosomes inhabit the Mediterranean and the warmer parts of the ocean, often occurring in incredible numbers. The combined individuals form a hollow tube, open at one extremity, which at night becomes vividly phosphorescent. The tube is frequently of considerable dimensions, often attaining a length of fourteen inches, and comprising a multitude of delicate, transparent individuals, which by their united efforts in ejecting the water from the cavity of their mantles propel the cylinder in a slow and retrograde manner. When the calm surface of tropical seas is densely studded with their myriads for several miles, the Naturalist enjoys a splendid sight as the ship glides through the pale green scintillating light.

Genus PYROSOMA, Péron.

Animal compound, the individuals forming a hollow cylinder closed and rounded at one end and open at the other. Each individual lies perpendicular to the axis of the tube, and all are united together by a common, non-contractile, cartilaginous basis, their inhalant apertures opening externally, their exhalant orifices internally.

Ex. P. giganteum, *Savigny*, pl. 136, fig. 2. Individual, P. giganteum, fig. 2, *a*.

In a squall at sea M. Péron first saw the phosphorescence of the Pyrosomes. "Suddenly," says he, "we discovered at some distance a great phosphorescent band stretched across the waves and occupying an immense tract in advance of the ship. Heightened by the surrounding circumstances, the effect of this spectacle was romantic, imposing, sublime, rivetting the attention of all on board. Soon we reached the illuminated tract, and perceived that the prodigious brightness was certainly and only attributable to the presence of an innumerable multitude of largish animals floating with the waves. From their swimming at different depths they took apparently different forms; those at the greatest depth were very indefinite, presenting much of the appearance of great masses of fire, or rather of enormous red-hot cannon-balls; whilst those more distinctly seen near the surface perfectly resembled incandescent cylinders of iron."

Species of Pyrosoma.

Atlanticum, *Peron.*
elegans, *Lesueur.*
giganteum, *Sav*

Fam. SALPIDÆ.

Animal free, pelagian, in the form of a more or less cylindrical tube open at one or both ends; test and mantle continuous with one another at the respiratory apertures, but elsewhere separated by a wide space; gill forming a hollow band crossing the respiratory cavity; anal orifice terminating close above, and to the right side of, the mouth. Alternately solitary and aggregated.

The Salpians occur under two distinct conditions, being at one time solitary, and at another associated into circular or lengthened groups. These *Salpa*-chains vary in length from a few inches to many feet, and swim through the water with a regular serpentine movement, but when taken from the water the individuals of the group are easily detached. Chamisso discovered that the solitary *Salpæ* do not belong to species distinct from those united in chains, however dissimilar, but are either the parents or the progeny, as the case may be, of the aggregate forms; and that chained *Salpæ* do not produce chained *Salpæ* but solitary *Salpæ*, which in their turn do not produce solitary but chained *Salpæ*, hence giving rise to the paradoxical statement made in the general observations on the Tunicaries.

Genus SALPA, Forskäl.

Animal oblong, sub-cylindrical, truncated in front by the oral orifice, pointed posteriorly; anal orifice sub-terminal; test thin, gelatinous, transparent; muscular mantle in the form of transverse or oblique bands; mantle-cavity lined by a system of vascular sinuses; gill rudimentary, forming an oblique band across the interior; visceral nucleus posterior. Sexes combined. Young produced by gemmation in chains, consisting of individuals unlike the parent and becoming oviparous, the alternate generations only being alike.

Syn. Thalia, *Brown.* Dagysa, *Banks and Soland.* Biphora, *Brug.* Tethis, *Tilesius.* Pegea, Jasis, *Savigny.*

Ex. S. runcinata, *Chamisso,* (solitary form,) pl. 136, fig. 3. S. runcinata, (aggregate form,) fig. 6, *a.*

In our list of species we have followed M. Krohn in using the oldest name and making it comprehend the two dissimilar states, which had been previously considered distinct species. M. Krohn makes three types, to which all the variations of the associated *Salpæ* are reducible. The first is characterized by the vertical position of the animals forming the chain, the axes of their bodies crossing the axis of the chain at a right angle. In the second the bodies of the individuals are more or less inclined to the axis of the chain. The third group is distinguished by the horizontal position of the component animals, the axes of their bodies being more or less parallel to the axis of the chain.

Species of Salpa.

Africana, *Forsk.*
democratica, *Forsk.*
gibba, *Bosc.*
polycratica, *Forsk.*
proboscidalis, *Lesson.*
punctata, *Forsk.*
runcinata, *Chamisso.*
strumosa, *Banks.*

Genus DOLIOLUM, Quoy and Gaimard.

Body transparent, cask-shaped, open at each end; anterior aperture somewhat tubular, the margin denticulated; posterior aperture also produced, its margin ciliated; muscular bands equidistant; respiratory cavity wide, central; gills in the form of two bands stretching across the cavity; mouth on the dorsal side in front of the fourth band.

Syn. Anchinæa, *Eschscholtz.*

Ex. D. denticulatum, *Quoy and Gaimard,* pl. 136, fig. 1.

The structure of the branchiæ of this Ascidian, and the position of the two orifices, as observed by Huxley, indicate a position for *Doliolum* intermediate between *Salpa* and *Pyrosoma*. The animal progresses by contracting the whole body and forcing the water out at one or the other extremity.

Species of Doliolum.

denticulatum, *Quoy and Gaim.*
Mülleri, *Krohn.*
Nordmanni, *Krohn.*
Troschelii, *Krohn.*

Genus APPENDICULARIA, Chamisso.

Body flask-shaped, with a lanceolate appendage; mouth at the bottom of the respiratory cavity; respiratory orifice at the smaller extremity; branchiæ represented by a ciliated band of the inner tunic; anus on the dorsal surface in front of the insertion of the caudal appendage.

Syn. Oikopleura, *Mertens.* Fretillaria, *Quoy and Gaim.* Vexillaria, *Müller.*

Ex. A. flagellum, *Chamisso*, pl. 136, fig. 5.

This curious genus, first discovered by Chamisso, near Behring's Straits, afterwards more fully described by Mertens, and observed in immense masses by Quoy and Gaimard, has been ably investigated by Huxley in the Philosophical Transactions, who has first shown the true relations of the animal, and its position among the Tunicated Mollusca. They would appear to typify, in their adult state, the larval condition of the higher Ascidians. The animal is rapidly propelled through the water by powerful vibrations of the long, curved, caudal lanceolate appendage.

APPENDIX.

PTEROPODA.

Genus AGADINA, Gould.

(Fam. LIMACINIDÆ.)

Shell colourless, pellucid, planorbular, one side showing five or six whorls, the other a single volution, with a large umbilical pit; aperture oblique, campanulate, and projecting beyond the last whorl like a hood.

Ex. A. cucullata, *Gould*, pl. 137, fig. 1. Shell, A. cucullata, fig. 1, *a*.

There is but one species of this genus at present described, which was found floating near an iceberg in 60° S. Lat., and 106° 20′ E. Long. The animal is black, with oval appendages.

Vol. i. p. 44. Genus SPIRULA.

The name *Ammonia*, Breyn, has priority over *Spirula*, Lamarck, and should be used for this genus, and the designation of the family should be altered to *Ammoniidæ*; the species *prototypus*, Peron, also should be *spirula*, Lam. *Lituina*, Link, is a synonym of *Ammonia*.

Vol. i. p. 53. Genus PLEUROPUS, Eschscholtz.

Diacria of Gray (Vol. i. p. 51) is synonymous with this genus. The species will stand as follows.

Species of Pleuropus.

depressus, *D'Orb.*
lævigatus, *D'Orb.*
longifilis, *Trosch.*
mucronatus, *Quoy and Gaim.*
pellucidus, *Eschsch.*
trispinosus, *Lesueur.*

Vol. i. p. 57. Genus TIEDEMANNIA.

This genus was first made known by Forskäl, in 1775, under the name of *Gleba*, which name should be used.

Genus GLEBA, Forskäl.

Syn. Argivora, *Lesueur*. Tiedemannia, *Van Beneden*.

Species of Gleba.

Charybdis, *Trosch.*
chrysosticta, *Krohn.*
cordata, *Forsk.*
punctata, *Quoy and Gaim.*
radiata, *Quoy and Gaim.*
Scylla, *Trosch.*

Vol. i. p. 59. Genus SPIRIALIS.

In this genus we included the *Heliconoides inflata* of D'Orbigny, in which the front of the aperture of the shell is prolonged into a spine-like curved beak. This peculiarity, however, appears sufficient to entitle it to be considered the type of a distinct genus.

Genus HELICONOIDES, D'Orbigny.

Operculum glassy, very thin, few-whorled.

Shell thin, transparent, discoidal, sinistral, axis umbilicated; whorls smooth; peristome disunited, notched on each side, and with an elongated arched beak in front.

Ex. H. inflata, *D'Orbigny*, pl. 137, fig. 2. Operculum, H. inflata, fig. 2, *a*. Shell, H. inflata, fig. 2, *b*.

Species of Heliconoides.

inflata, *D'Orb.*
scaphoidea, *Gould.*

Vol. i. p. 59. Genus HETEROFUSUS.

In this genus the species *clathratus*, of which we have figured

the shell, may with propriety be considered as the type of a group, and be defined as follows.

Sub-gen. EUROMUS, H. and A. Adams.

Shell oblong, not turreted, cancellated; spire short, obtuse, last whorl swollen, much larger than the others; aperture large, elongate.

Genus CLIOPSIS, Troschel.

(Fam. PNEUMODERMONIDÆ.)

Body ovate. Head keeled; mouth armed with three jaws; two lateral tentacles. Fins two, oblong, lateral, anterior, with a truncate intermediate lobe. A ciliated ring round the hinder end of the body.

Ex. C. Krohnii, *Troschel*, pl. 137, fig. 3.

The ciliated ring round the base of the head, and the similar ring round the middle of the body, seen in *Trichocyclus*, are wanting in this genus.

Vol. i. p. 60. Genus CHELETROPIS.

Mr. J. D. Macdonald has made us acquainted with the organization of the animal of this genus, rendering its removal from the Pteropods to the Heteropodous family *Macgillivrayiidæ* necessary. The arms, four in number, are arranged in a cruciform manner round the head. There are two tentacles, and the eyes, well-formed, are situated on the outer side of their bases. The respiratory siphon is short, being a simple fold of the mantle. The foot is large and very mobile, and furnished with a small, thin operculum; it is unprovided with a float. The lingual membrane is of considerable length, with central and lateral teeth, and the mouth is furnished with two file-like triturating plates. The gill is included, long, single, and pectinated; what was formerly described by the observer as naked gills being the ciliated cephalic arms.

The name *Cheletropis* must be changed to *Sinusigera*, D'Orbigny, which has priority, and the specific name *Huxleyi* to

that of *microscopica*, Gray, the shell having been already described as *Struthiolaria microscopica* in the "Voyage of the Blossom."

The specimen of *S. cancellata* we figure was taken by one of the authors during the voyage of H. M. S. "Actæon" from England to Rio Janeiro, who confirmed by examination the principal of the observations of Mr. Macdonald above quoted; during the continuation of the voyage of the "Actæon" to Hong-kong, he met with and has recently described three other species.

Ex. S. cancellata, *D'Orbigny*, pl. 137, fig. 4.

Species of Sinusigera.

cancellata, *D'Orb.*
glabra, *A. Adams.*
trochoides, *A. Adams.*
vitrea, *A. Adams.*

GASTEROPODA.

Vol. i. p. 70. Genus MUREX.

The sub-gen. *Vitularia* should form a genus in the sub-family *Purpurinæ*. The operculum is oblong, with the nucleus on the middle of the outer edge. *Trophon labiosus* and *crassilabrum* are species of *Vitularia*.

Vol. i. p. 79. Genus NEPTUNEA.

Sub-gen. VOLUTOPSIUS, Mörch (Strombella, *Gray*, not *Schlüt.*).

Shell with the outer lip expanded. *N. Norvegica* is an example.

Vol. i. p. 87. Fam. TURRITIDÆ.

This family, as indicated at page 246, should be placed in the sub-order *Toxifera*, and be designated *Turridæ*. The name of the sub-family, *Turritinæ*, should also be changed to *Turrinæ*, and the terminations of the species of the genus *Turris* should be feminine.

Vol. i. p. 107. Genus BUCCINUM.

Sub-gen. VOLUTHARPA, Fischer.

Shell ventricose, thin; spire short; aperture very large. *B. Deshayesianum*, Fischer, is an example.

Vol. i. p. 110. Genus COMINELLA.

M. Dunker has proposed a new genus, under the name of *Adamsia*. It is closely allied to *Cominella*, of which it may be considered a sub-genus, differing from the typical species in being without the posterior callus. *C. typica*, Dunker, is an example.

Vol. i. p. 122. Genus TEINOSTOMA.

The species *anomalum*, C. B. Adams, should be *pusillum*, C. B. Adams, and *Vitrinella minuta*, C. B. Adams, also belongs to this genus. Mr. P. P. Carpenter has since described two other species, *amplectans* and *substriatium*, and he considers the genus to be allied to *Umbonium*, in which opinion, upon a further comparison of the shells, we are inclined to agree, and to transfer it accordingly to the sub-family *Umboniinæ*.

Vol. i. p. 145. Genus OLIVELLA.

It is stated by Dr. Gray that *Olivella* (*Lamprodoma*) *volutella* is not furnished with an operculum, in which case the sub-genus *Lamprodoma*, of which *Ramola*, Gray, is a synonym, must be kept as a genus.

Vol. i. p. 157. Fam. VOLUTIDÆ.

The following arrangement of the *Volutidæ* has recently been proposed by Dr. Gray.

Fam. VOLUTIDÆ.

The lingual membrane linear; teeth in a single central series. Siphon of the mantle very short, recurved. Foot very large, and often deeply nicked on the side in front.

Operculum annular, or none.

Shell with a nick in front for the siphon. The front of the pillar regularly and deeply plaited.

Sub-fam. VOLUTINÆ.

Teeth broad, lunate; apex three-lobed. Tentacles far apart, united together by a broad veil forming a hood over the head; eyes situated far back, behind the base of the small tentacles. Mantle sometimes greatly developed, covering the sides of the shell; base of siphon furnished with auricles on the sides.

Genus CYMBIUM, Klein (Yetus, *Adanson*).

cymbium, *Linn.*
gracile, *Brod.*
navicula, *Gmel.*
Neptuni, *Gmel.* (patulum, *Brod.* Tritonis, *Brod.*).
olla, *Linn.*
porcinum, *Lam.*
proboscidale, *Lam.*
rubiginosum, *Swains.*

Genus MELO, Humphrey (Cymbium, *Montf.*).

Æthiopica, *Linn.*
armata, *Lam.* (senticosa, *Bolt.*)
Broderipii, *Gray.*
diadema, *Lam.* (ramosa, *Meusch.*).
Georginæ, *Gray* (mucronata, *Brod.*).
melo, *Soland.* (Indica, *Gmel.*)
Miltonis, *Gray.*
nautica, *Lam.*
tesselata, *Lam.*
umbilicata, *Brod.*

Genus SCAPHA, Gray.

nivosa, *Lam.*
Norrisii, *Sow.*
pulchra, *Sow.*
rutila, *Brod.*
vespertilio, *Linn.*

Sub-gen. AURINIA, H. and A. Adams (Livonia, *Gray*).

Nucleus or shell of the very young animal very large, irregularly spiral.

dubia, *Brod.* mamilla, *Gray*.

Sub-gen. AULICA, Gray.

Nucleus large, regularly spiral, smooth.

aulica, *Soland.*
Deshayesii, *Reeve.*
Junonia, *Chem.*
luteostoma, *Chem.*
magnifica, *Chem.*
piperita, *Sow.*
punctata, *Swains.*

Sub-gen. CYMBIOLA, Swainson.

Nucleus small, regularly spiral, smooth.

colocynthis, *Chem.* (Brasiliana, *Soland.*).
Ferusacii, *Donov.*
Magellanica, *Chem.* (ancilla, *Soland.* Beckii, *Brod.*).

Sub-gen. ALCITHOË, H. and A. Adams.

Nucleus small, spiral, smooth, with the upper whorl rather swollen and irregular.

concinna, *Brod.*
fusiformis, *Swains.*
fusus, *Quoy and Gaim.* (tuberculata, *Swains.*).
megaspira, *Sow.*
Pacifica, *Soland.* (gracilis, *Swains.*).

Genus VOLUTA, Linnæus.

ebræa, *Linn.* musica, *Linn.*

Sub-gen. CHLOROSINA, Gray.

Outer lip thickened, reflexed on the edge; inner lip thickened, compressed.

polyzonalis, *Brug.*

Sub-gen. HARPULA, Swainson.

Outer lip rounded, not reflexed on the edge.

Lapponica, *Linn.* vexillum, *Chem.*

Genus FULGORARIA, Schumacher.

rupestris, *Gmel.* (fulgora, *Mart.*).

Genus LYRIA, Gray.

festiva, *Lam.*
lyræformis, *Brod.*
mitriformis, *Lam.*
nucleus, *Lam.*

Sub-gen. HARPELLA, Gray.

Aperture ovate; outer lip moderate, without any internal rib; inner lip with numerous small grooves.

costata, *Swains.* (lyrata, *Humph.*).
Delessertiana, *Petit.*

Sub-gen. ENÆTA, H. and A. Adams.

Aperture narrow; outer lip thickened externally, with a convex varix and a strong internal central rib; inner lip smooth.

Cumingii, *Brod.*
cylleniformis, *Sow.*
Guildingii, *Sow.*
harpa, *Barnes.*

Genus VOLUTILITHES, Swainson.

abyssicola, *Adams and Reeve.*

Genus CALLIPARA, Gray.

bullata, *Swains.*

Genus ZIDONA, H. and A. Adams (Volutella, *D'Orb.*, not *Swains.*).

angulata, *Swains.*

Sub-gen. AUSOBA, H. and A. Adams (Nobilia, *Gray*).

Mantle-lobes moderately expanded, covering the lower side of the spire, and leaving a callous band on the suture of the upper side; spire often crowned.

cymbiola, *Chem.*
imperialis, *Soland.*
scapha, *Gmel.*
Sophia, *Gray.*
volvacea, *Gmel.*

Sub-gen. ERICUSA, H. and A. Adams (Scaphella, *Gray*, not *Swains.*).

Mantle-lobes moderately expanded, not covering the spire; suture simple; spire not crowned.

fulgetrum, *Sow.*
papillosa, *Swains.*

Sub-fam. SCAPHELLINÆ.

Teeth linear, base angularly diverging, with a single conical apex. Tentacles elongated, united by a large veil; eyes sunk at the base of their hinder edge. Mantle enclosed; siphon with distinct ear-like lobes. Operculum none.

Genus SCAPHELLA, Swainson (Amoria, *Gray*).

Shell fusiform; spire conic, nucleus small, spiral; suture of whorls with a callous edge; aperture elongate; pillar with five oblique plaits in front.

lineata, *Leach.*
maculata, *Swains.*
marmorata, *Swains.*
reticulata, *Reeve.*
Turneri, *Gray.*
undulata, *Lam.*
zebra, *Leach.*

Vol. i. p. 172. Genus VOLUTOMITRA.

This genus has been included by Dr. Gray in the family *Volutidæ*, in which he has constituted a sub-family, *Volutomitrinæ* to receive it.

Sub-fam. VOLUTOMITRINÆ.

Teeth with a narrow, angular, diverging base, and a single conical apex. Tentacles subulate, close together at the base; eyes on tubercles above the base. Mantle enclosed; siphon simple at the base. Operculum none.

Vol. i. p. 181. Genus COLUMBELLA.

Some of the species of the sub-genera *Nitidella* and *Mitrella* have the operculum like that of *Purpura*. These groups should therefore form a genus in the sub-family *Purpurinæ*, under the name of *Mitrella*.

Vol. i. p. 192. Genus PERSICULA.

Sub-gen. RABICEA, Gray.

Shell with the inner lip callous, with a large cross fold in front; outer lip crenulated. *P. interruptolineata* (*interrupta*, Lam.) is an example.

Vol. i. p. 197. Genus RINGICULA.

According to the recent observations of Mr. Woodward, the animal of this genus is like that of *Actæon*, and the lingual dentition similar to that of *Philine* and *Scaphander*. It should therefore be removed to the family *Actæonidæ*.

Vol. i. p. 200. Fam. LAMELLARIIDÆ.

M. Rudolph Bergh in his "Monograph of *Marseniida*" has distributed the species as follows.

Genus MARSENIA, Leach.

Shell internal, spiral. Mantle not cloven in front.
Seventeen species.

Sub-gen. CHELINOTUS, Swainson.

Mantle cloven in front.
Four species.

Genus ONCHIDIOPSIS, Beck.

Shell internal, not spiral.
Two species.

Genus MARSENINA, Gray.

Shell partly external, spiral.
One species.

Genus AMAUROPSIS, Mörch.

(Fam. NATICIDÆ.)

Operculum horny, paucispiral, thin.

Shell longitudinally oval, thin, smooth, white, not umbilicated, covered with a light brown epidermis; spire elevated, suture canaliculated; aperture oval, produced in front.

Ex. A. cornea, *Müller*, pl. 137, fig. 5.

This genus comprises the species, *canaliculata*, Gould, and *cornea*, Müller, which we had included in the genus *Amaura*.

Vol. i. p. 219. Genus MORUM.

A species of this genus has recently been described by Mr. Hanley, under the name of *M. ponderosum*, possessing so great a peculiarity in the pillar lip as to entitle it to form the type of a distinct group which he suggests might be distinguished as follows.

Sub-gen. HERCULEA, Hanley.

Shell tuberculated; inner lip sulcated, not granulated.

Vol. i. p. 220. Genus SCALA.

Sub-gen. ACIRSA, Mörch.

Shell turreted, thin; whorls united, varices obsolete; outer lip thin, simple. *S. Eschrichti* is an example.

Vol. i. p. 223. Fam. TEREBRIDÆ.

The teeth in this family are said to be similar to those in *Conidæ*, although the mouth, as in *Turridæ*, is without the

rostrum-like veil. Dr. Gray accordingly places the *Terebridæ* in the sub-order *Toxifera*.

Genus CHRYSALLIDA, Carpenter.

(Fam. PYRAMIDELLIDÆ.)

Shell pupiform, generally cancellated; aperture contracted, peristome continuous, thin; columella with a plait, frequently concealed.

Ex. C. communis, *C. B. Adams*, pl. 137, fig. 6.

This genus is founded upon certain species of *Turbonilla*, having a distinct though hidden plait.

Species of Chrysallida.

clathratula, *C. B. Adams.*
clausiliformis, *Cpr.*
communis, *C. B. Adams.*
convexa, *Cpr.*
effusa, *Cpr.*
fasciata, *Cpr.*
indentata, *Cpr.*
nodosa, *Cpr*
oblonga, *Cpr.*
ovata, *Cpr.*
ovulum, *Cpr.*
Photis, *Cpr.*
Reigeni, *Cpr.*
rotundata, *Cpr.*
telescopium, *Cpr.*

Vol. i. p. 230. Genus TURBONILLA.

Mr. P. P. Carpenter has also constituted a sub-genus of *Turbonilla* to receive the species of that genus from Mazatlan, described by him, which have the whorls rounded.

Sub-gen. DUNKERIA, Carpenter.

Shell with the whorls tumid, decussated. *T. cancellata*, *intermedia*, *pauciliratа*, and *subangulata*, are examples.

Vol. i. p. 239. Genus ENTOCONCHA, J. Müller.

We had considered that *Entoconcha* might be synonymous with *Stylifer*, but from the description of the genus, which we

now subjoin, it appears to differ sufficiently to entitle it to be kept distinct.

Operculum non-spiral.

Shell obovate, smooth; spire short, very obtuse, apex not elevated, whorls rapidly increasing; aperture transverse, semi-lunar, angulated above, rounded below, width almost equalling the height, margins disunited, the columellar margin straight.

Ex. E. mirabilis, *J. Müller*.

Found parasitic on *Synapta digitata*, one of the *Holothuriidæ*, at Trieste.

Vol. i. p 264. Genus CYPRÆA.

Sub-gen. NARIA, Gray.

Shell with the front of the columella narrow, dilated into a sharp-toothed ridge, with a distinct fold in front, separated from the teeth by a deep groove. *C. irrorata* is an example.

Genus PELICARIA, Gray.

(Fam. APORRHAIDÆ.)

Shell spiral; spire of adult covered with an enamel coat; aperture ovate; outer lip sinuous, sharp-edged.

Ex. P. scutulata, *Martyn* (vermis, *Gray*), pl. 137, fig. 7. Operculum, P. scutulata, fig. 7, *a*.

Genus CLEA, H. and A. Adams.

(Sub-fam. MELANOPSINÆ.)

Shell bucciniform, ovate, covered with a brown-black, horny epidermis; spire as long as the aperture, apex decollated, whorls rather convex, transversely striated; aperture oblong-ovate, with a distinct notch in front; columella abruptly truncate, with a single oblique, spiral fold anteriorly; outer lip simple, the margin somewhat reflexed, and thickened internally.

Ex. C. nigricans, *A. Adams*, pl. 137, fig. 8.

Vol. i. p. 335. Genus HYDROBIA.

The genus *Littorinida*, described by Eydoux and Souleyet in the "Zoology of the Voyage of the Bonite," ii. p. 536, is synonymous with this genus. The species is from Guayaquil, and is named by the French Naturalists *Littorinida Gaudichaudii*.

Genus LARINA, A. Adams.

(Fam. VIVIPARIDÆ.)

Operculum annular, horny, ovate, elements concentric; nucleus intramarginal, near the middle of the inner edge.

Shell imperforate, semi-globose, thin; spire obtuse, whorls few, tumid, covered with an olivaceous epidermis, last whorl large and ventricose; aperture wide, ovate; outer lip simple, regular, acute.

Ex. L. Strangei, *A. Adams*, pl. 137, fig. 9. Operculum, L. Strangei, fig. 9, *a*.

The shell on which this genus is founded is from Moreton Bay, in Australia, most probably from some of the fresh-water streams or water-courses in the vicinity. We have referred it provisionally to the *Viviparidæ* until the animal is known or its habits ascertained; the concentric operculum and general appearance of the shell, however, would seem to point out strong affinities with the genera of that family.

Vol. i. pp. 339 and 340. Genera PALUDOMUS and TANALIA.

Mr. E. L. Layard has separated the genera *Paludomus* and *Tanalia* into four divisions from the peculiarities of the operculum, as follows.

Genus PALUDOMUS, Swainson.

Operculum with the apex superior and slightly inclined, concentrically striate; nucleus sub-central, *sinistral*.

Ex. P. chilinoides, *Reeve*.

Genus GANGA, Layard.

Operculum with the apex superior, slightly inclined, concentrically striate; nucleus sub-central, *dextral.*

Ex. G. dilatata, *Reeve.*

Genus TANALIA, Gray.

Operculum with the apex lateral, lamellated; nucleus *lateral*, dextral.

Ex. T. aculeata, *Chemnitz* (loricata, *Reeve*).

Genus PHILOPOTAMIS, Layard.

Operculum with the apex superior, paucispiral; nucleus *subbasal*, dextral.

Ex. P. sulcatus, *Reeve.*

Mr. Benson, in the "Annals of Natural History," for June, 1856, has stated that the nucleus of the operculum in *Paludomus* proper is sub-spiral, which distinguishes it from *Vivipara.* He adds, moreover, that the *Philopotamis* of Layard has a subspiral operculum, which seems rather to indicate its place to be among the *Melaniidæ. Serenia* of Benson will stand as a synonym of *Tanalia*, and *Heteropoma* of Benson as a synonym of *Philopotamis.* The terminations of the species of *Paludomus* should be feminine.

Genus RIVULINA, Lea.

(Fam. VIVIPARIDÆ.)

Operculum like that of *Paludina.*

Shell ovate, conical, smooth; upper whorls dotted or lined with brown; peritreme continuous, with a slight depression behind the columella in place of an umbilicus.

Ex. R. modicella, *Lea.*

To this genus must also be referred the species *Zeylanica*, which, as well as *modicella*, we had included in the genus *Paludomus.*

Vol. i. p. 342. Genus NEMATURA.

This name having been previously used by Fischer for a genus of birds, Mr. Benson, at our suggestion, has altered it to *Stenothyra*, the species of which will stand as follows.

cingulata, *Bens.*
coarctata, *Lea.*
Deltæ, *Bens.*
foveolata, *Bens.*
frustillum, *Bens.*
glabrata, *A. Adams.*
minima, *Sow.*
monilifera, *Bens.*
polita, *Sow.*
puncticulata, *A. Adams.*
strigilata, *Bens.*
ventricosa, *Quoy and Gaim.*

Genus PETALOCONCHUS, Lea.

(Fam. VERMETIDÆ.)

Animal unknown.

Operculum small, very thin, horny, smooth, somewhat flat, scarcely spiral.

Shell externally similar to that of *Bivona*, internally very rarely with transverse septa; the median whorls with elongated spiral laminæ variously disposed, generally two larger ones, and a third smaller, as if representing a columellar plica.

Ex. P. nerinæoides, *Carpenter*, pl. 137, fig. 10.

Species of Petaloconchus.

cereus, *Cpr.*
cochlidium, *Cpr.*
flavescens, *Cpr.*
macrophragma, *Cpr.*
nerinæoides, *Cpr.*
octosectus, *Cpr.*
renisectus, *Cpr.*
varians, *D'Orb*

Vol. i. p. 355. Fam. CÆCIDÆ.

In an elaborate and able monograph of this family, Mr. P. P. Carpenter proposes the following arrangement.

Genus CÆCUM.

Add syn. Cornuoides, *Brown.* Anellum, *Cpr.*

Species of Cæcum.

annulatum, *Brown.*
clathratum, *Cpr.*
elegantissimum, *Cpr.*
elongatum, *Cpr.*
firmatum, *C. B. Adams.*
Floridianum, *Stimp.*
gracile, *Cpr.*
gurgulio, *Cpr.*
pulchellum, *Stimp.*
quadratum, *Cpr.*
regulare, *Cpr.*
subimpressum, *Cpr.*
trachea, *Mont.*
undatum, *Cpr.*

Sub-gen. ELEPHANTULUM, Carpenter.

Shell in the adult state transversely striated.

abnormale, *Cpr.*
heptagonum, *Cpr.*
imbricatum, *Cpr.*
insculptum, *Cpr.*
laqueatum, *C. B. Adams.*
liratocinctum, *Cpr.*
obtusum, *Cpr.*
plicatum, *Cpr.*
subspirale, *Cpr.*

Sub-gen. FARTULUM, Carpenter.

Shell smooth.

bimarginatum, *Cpr.*
corrugulatum, *Cpr.*
dextroversum, *Cpr.*
farcimen, *Cpr.*
læve, *C. B. Adams.*
pollicare, *Cpr.*
reversum, *Cpr.*
subquadratum, *Cpr.*
teres, *Cpr.*
vitreum, *C. B. Adams.*

Genus BROCHINA, Gray.

Operculum convex externally, with a succession of spiral terraces.

Shell like that of *Cæcum*, smooth; aperture simple, acute; septum mamillate.

Species of Brochina.

glabra, *Mont.* glabriformis, *Cpr.*

Genus MEIOCERAS, Carpenter.

Operculum spiral, concave externally.

Shell in the young state loosely spiral; when adult often inflated; aperture oblique.

Species of Meioceras.

cornu-bovis, *Cpr.* nitidum, *Bean.*
cornu-copia, *Cpr.*

Vol. i. p. 356. Genus SIPHONIUM.

Mr. P. P. Carpenter, in his "Catalogue of Mazatlan Mollusca," has made a sub-genus of *Siphonium*, under the following name.

Sub-gen. ALETES, Carpenter.

Operculum slightly concave, multispiral, often irregularly formed. *S. centiquadrus* and *margaritarum* are examples.

In the typical species of *Siphonium* the operculum is strongly concave and scarcely spiral, and the species are found in the Atlantic Ocean and Eastern Seas, while those of *Aletes* are from the Western Hemisphere.

Vol. i. p. 368. Genus CRYPTA.

Sub-gen. GARNOTIA, Gray.

Shell convex; apex sub-central; inner lip deep within the cavity, shelving downwards in front. *C. Solida* is an example.

Vol. i. p. 412. Genus TROCHUS.

Sub-gen. ROCHIA, Gray.

Shell with a strong fold on the pillar-lip, and a deep sinus behind, near the whorl. *T. acutangulus* is an example.

Vol. i. p. 414. Genus POLYDONTA.

Sub-gen. PRÆCIA, Gray.

Shell, with the pillar-lip twisted, simple; axial cavity deep, narrow, with a distinct, narrow, central, spiral rib. *P. elegantula* is an example.

Sub-gen. ANTHORA, Gray.

Shell with the pillar-lip twisted, simple; axial cavity moderate, narrow, with several opaque, sub-spiral ridges. *P. tuberculata* is an example.

Vol. i. p. 434. Genus VITRINELLA.

According to Dr. Gray, certain of the smaller species of *Cyclostrema*, included by Brown in his genus *Delphionoidea*, are *Vitrinellæ*. The name *Delphionoidea*, however, it would be more correct to add as a synonym of *Skenea*, and to transfer the species of *Cyclostrema* in question to the genus *Vitrinella*, which will then include the following species in addition to those already given, excepting *minuta*, which is a *Teinostoma*, and *megastoma*, *semistriata*, and *striata*, which are species of *Ethalia*.

costulata, *Müll.*
elegantula, *Phil.*
lævis, *Phil.*
nitens, *Phil.*
nitidissima, *C. B. Adams.*
rota, *Forbes and Hanley.*
serpuloides, *Mont.*

Genus VALVATELLA, Gray.

(Sub-fam. TROCHINÆ.)

Operculum circular, horny, many-whorled.

Shell conic; whorls rounded, with laminar periostraca; axis imperforate; aperture circular, peristome simple.

* *Ex.* V. Grœnlandica, *Gray*.

Genus PLEUROTOMARIA, Defrance.

(Sub-fam. STOMATELLINÆ.)

Shell trochiform, not umbilicated; spire elevated, whorls rounded next the suture, with transverse granular ridges; aperture semi-oval; inner lip thin, pearly; outer lip simple, not nacreous within, deeply fissured.

Ex. P. Quoyana, *Fischer and Bernardi*, pl. 137, fig. 11.

The only recent species of this genus known is from the Island of Marie-Galante.

Vol. i. p. 439. Genus ANATOMUS.

The animal of *Anatomus* or *Scisurella* has been made known to us by Mr. Lucas Barrett, and its position among the *Trochidæ* is thus confirmed. The following is his description: "Tentacles long, serrate, at the base of which are placed the eyes; foot furnished with two pointed lappets, and two long, slender, serrated cirrhi on each side. Operculum very thin, ovate, with an obscure, sub-spiral nucleus. No part of the animal was external to the shell. The only living specimen occurred at Hammerfest in forty to sixty fathoms of water. When it was placed in a glass of sea-water it crawled up the side and scraped the glass with its tongue. After immersion in spirit it became inky black."

Ex. A. crispatus, *Fleming*, pl. 137, fig. 12.

Vol. i. p. 447. Genus LUCAPINA.

Mr. P. P. Carpenter, in his "Catalogue of Mazatlan Mollusca," has proposed a sub-genus of *Lucapina*, which he describes as follows.

Sub-gen. GLYPHIS, Carpenter (Capiluna, *Gray*).

Animal with the edge of the mantle fimbriated and covering the margin of the shell.

Shell with the surface cancellated, the margin crenulated, callosity often truncate, sometimes laminated. Young shell Rimuliform, with the spire absorbed in the increasing aperture. *L. inæqualis* is an example.

Vol. i. p. 473. Genus TONICIA.

Sub-gen. FANNYIA, Gray.

Mantle broad. Shell with the valves moderate, sub-cordate, rounded and far apart on the sides. *T. disjuncta* is an example.

Genus HANLEYA, Gray.

(Sub-fam. CRYPTOPLACINÆ.)

Body depressed. Mantle spinulose; lateral tufts of spines small.

Shell with the exposed part of the valves broader than long; margin of insertion of the valves entire, of the anterior and posterior valves very narrow.

Ex. H. debilis, *Thorpe* (included in the list of species of *Chætoplura* as *Hanleyi*).

Vol. ii. p. 29. Genus ATLAS.

The recent researches of Mr. J. G. Macdonald have shown that the genus *Atlas* does not belong to the *Bullidæ*, or even to the *Mollusca*. He considers it more nearly allied to the *Bryozoa*, the ciliated circle of *Atlas* resembling the circle of tentacula in a polype of *Bowerbankia*. Possibly it may be the larva of some genus of *Annelida*, as Mr. Macdonald observes that it would appear to represent permanently the larval state of *Siphunculus*. (*See* Max. Müller, *Archiv.* 1850, v.)

Genus SUSANIA, Gray.

(Sub-fam. PLEUROBRANCHINÆ.)

Mantle very large, broadly margining the foot, vesicular, deeply notched in front; frontal veil between the base of the tentacles and mouth large and oblong; foot oblong, rather narrow. Shell very small.

Ex. S. testudinaria, *Philippi*, pl. 137, fig. 13.

In this genus the mantle is notched in front, while in *Pleurobranchus* it is entire.

Vol. ii. p. 52. Genus CERATODORIS.

This genus was established by Dr. Gray upon *Doris eolida* of Quoy and Gaimard, which is supposed by Mr. Alder to be a young *Idalia*.

Genus CHROMODORIS, Alder and Hancock.

(Sub-fam. DORIDINÆ.)

Body sub-quadrangular. Dorsal tentacles laminated, retractile within plain or margined cavities; oral tentacles conical or tubercular. Gills linear, pinnate.

Ex. C. magnifica, *Quoy and Gaimard.*

The species upon which this genus is founded we had included in *Doriprismatica*.

Genus TREVELYANA, Kelaart.

(Sub-fam. POLYCERINÆ.)

Body narrow, elevated and inflated near the gills. Head simple, rather produced and rounded; tentacles short, conical, pointed, non-retractile, without sheaths, the upper half indistinctly laminated. Gills numerous, plumose, surrounding the dorsal vent, without lateral appendages. Foot long and broad, terminating posteriorly in a lancet-shaped point a short distance from the body.

Ex. T. Ceylonica, *Kelaart*, pl. 137, fig. 14.

Vol. ii. p. 54. Genus POLYCERA.

Sub-gen. PALIO, Gray.

Frontal veil short, bi-lobed, tuberculated on the edge. Gills branched, with more than one tubercular appendage on each side. *P. Ocellata* is an example.

Vol. ii. p. 71. Genus CHIORÆRA.

We are now enabled to give a figure of this genus, taken from the "United States Exploring Expedition."

Chiorœra leonina, *Gould*, pl. 138, fig. 1.

Genus CALMA, Alder and Hancock.

(Sub-fam. ÆOLIDINÆ.)

Body depressed, rather broad. Tentacles small, simple, linear. Gills linear-fusiform, clustered on cylindrical footstalks. Foot broad, anterior angles acute.

Ex. C. glaucoides, *Alder and Hancock.*

Genus FACELINA, Alder and Hancock.

(Sub-fam. ÆOLIDINÆ.)

Body rather slender. Dorsal tentacles laminated; labial feelers long. Gills linear or fusiform, clustered. Foot narrow, with the anterior angles acute and much produced.

Ex. F. coronata, *Forbes.*

The following species, comprised in this genus, we had referred to *Flabellina.*

annulicornis, *Nat. Cur.*
coronata, *Forbes.*
crassicornis, *Eschsch.*
minima, *Forsk.*
subrosacea, *Eschsch.*

Genus CUTHONA, Alder and Hancock.

(Sub-fam. ÆOLIDINÆ.)

Body depressed. Head much produced at the sides; tentacles simple, linear. Gills clavate, in close-set rows. Foot broad, rounded in front.

Ex. C. nana, *Alder and Hancock.*

Genus GALVINA, Alder and Hancock.

(Sub-fam. ÆOLIDINÆ.)

Body stoutish. Tentacles linear, slender; labial feelers short. Gills in rather distant rows, fusiform, inflated. Foot with the anterior angles rounded.

Ex. G. tricolor, *Forbes.*

To this genus Messrs. Alder and Hancock also refer the species *cingulata*, which, as well as *tricolor*, we had included in the genus *Montagua.*

Vol. ii. p. 79. Genus CLŒLIA.

This genus, which is synonymous with *Hero* of Lovén, is distinct from *Embletonia* of Alder and Hancock, and Dr. Gray, from its peculiarities, has established a family to receive it.

Fam. HEROIDÆ.

Mantle obsolete; frontal veil rather large, plain, produced at the sides. Tentacles two, linear, simple, not retractile. Gills branched or umbellated. Lingual membrane with a central series of large denticulated spines, and two series of simple lateral teeth. Jaws corneous.

Genus HERO, Lovén.

Body slender. Mantle adnate; labial veil ample, produced on both sides into an oblong lobe. Tentacles simple, unpro-

tected, contractile. Gills lateral, a simple series on each side, branched like a shrub.

Syn. Clœlia, *Lovén.*

Species of Hero.

fimbriata, *Vahl.* formosa, *Lovén.*

The genus *Embletonia* should be transferred to the sub-family *Æolidinæ*, and be defined as follows.

Genus EMBLETONIA, Alder and Hancock.

Body slender. Dorsal tentacles simple; labial feelers flattened into two lateral lobes. Gills fusiform, set in a single or double series on each side.

Syn. Pterochilus, *Alder and Hancock.*

Ex. E. pulchra, *Alder and Hancock*, pl. 67, fig. 5.

Species of Embletonia.

minuta, *Forbes and Goodsir.* pulchra, *Alder and Hanc.*

pallida, *Alder and Hanc.*

HETEROPODA.

Vol. ii. p. 88. Genus MACGILLIVRAYIA.

Mr. J. D. Macdonald, Assistant-Surgeon of H.M.S. "Torch," has examined the animal of this genus in a living state. He finds that there are four retractile ciliated arms or appendages encircling the head, coalescing behind the tentacles and eyes. These arms are transparent, and in the extended state are

several times the length of the shell. The tentacles are two, each bearing at the outer side of its base a well-developed eye. There is a lingual ribbon with well-marked rachis and pleuræ, and very perfect labial plates with closely-set dental points arm the mouth. The siphon, long and tubular, and formed by a fold of the mantle, protrudes from the shell on the left side. The foot is large and very mobile, the disk broad, and connected by a narrow attachment to the body just beneath the neck; it carries an operculum behind, and is cleft by a notch in front. The vesicular float, like that of *Ianthina*, consists of an aggregation of vesicles varying in number and size; its co-existence with an operculum shows that it is not a modification of the latter.

A third species of *Macgillivrayia* has recently been met with by one of the authors near the Cape de Verd Islands during the voyage of H.M.S. "Actæon" from England to Rio (the same species as that erroneously referred to at vol. ii. p. 89 as a *Calcarella* or *Brownia*), and named by him *echinata*; and a fourth species was subsequently taken by him in the South Atlantic, which he described under the name of *setigera*.

Vol. ii. p. 89. Genus CALCARELLA.

D'Orbigny, in Ramon de la Sagra's Work on Cuba, 1841, indicated his *Helicophlegma Candei* as a new genus under the name of *Brownia*. In Wiegmann's Archives for 1853 Krohn described a new genus from the coast of Messina, under the name of *Echinospira*, which agrees with the *Brownia* of M. D'Orbigny. More recently M. Souleyet has described the same genus under the name of *Calcarella*, and Mr. Macdonald under that of *Jasonilla*. It should therefore have its original name restored as follows.

Genus BROWNIA, D'Orbigny.

Animal as in *Macgillivrayia*.

Shell cartilaginous, sub-orbicular, thin, diaphanous, bi-carinate, the keels crenulate, umbilicus perforate; aperture wide, angular, laterally sinuous.

Syn. Echinospira, *Krohn.* Calcarella, *Souleyet.* Jasonilla, *Macdonald.*

Species of Brownia.

angulata, *A. Adams.*
Candei, *D'Orb.*
carinata, *A. Adams.*
diaphana, *Krohn.*
McLeayiana, *Macdonald.*

The *animal* of *Brownia* (*Jasonilla*) has been thus described by Mr. Macdonald:—

"Animal with eight ciliated cephalic appendages encircling the head. Mouth with two massive lateral jaws, with sharp prominent dental processes on the anterior border. Tentacles simple, with the eyes at their outer bases. Foot elongated, subquadrate in front, tapering behind."

The *shell* also is thus described:—

"Shell cartilaginous, transparent, planorbular, symmetrical, presenting four rows of minute conical tuberculations on its convex or dorsal surface, nucleus sunken, leaving a central perforation; outer lip deeply notched between the two lateral rows of tubercles."

In this interesting and beautiful little genus of pelagian gasteropods the lingual ribbon is lengthy and flexuous, presenting a row of uncini on each side, which interlock with one another so closely as almost completely to conceal the rudimentary segments of the rachis. A pectinate gill extends beneath the mantle along the anterior third of the dorsal region, lying in advance of the heart. Mr. Macdonald states that he has seen but one species, which was frequently taken between Port Jackson and the Isle of Pines.

The two new species added to the list, and recently described by one of the authors, were taken by him during the voyage of H.M.S. "Actæon" in the China Sea.

Genus ETHELLA, H. and A. Adams.

(Fam. MACGILLIVRAYIIDÆ.)

Ciliated arms six in number. Creeping disk rudimentary;

operculigerous lobe long, cylindrical, bearing the operculum on its truncated extremity.

Operculum claw-like, with a spiral nucleus situated near the internal or thickened border.

Shell spiral, turbinate, imperforate; spire elevated, whorls rounded; aperture oval, produced in front.

Ex. E. Macdonaldi, *H. and A. Adams*, pl. 138, fig. 2. Operculum, E Macdonaldi, fig. 2, *a*. Shell, E. Macdonaldi, fig. 2, *b*.

This genus was observed by Mr. Macdonald during the voyage of H.M.S. "Torch" from Sydney to Moreton Bay. He describes the little animal as wielding its clawed operculum, apparently as a means of defence, with great dexterity, and making skips and jerks by means of its complex foot, after the manner of *Nassa* and *Strombus*.

Genus GEMELLA, H. and A. Adams.

(Fam. MACGILLIVRAYIIDÆ.)

Operculum paucispiral, the lines of growth well marked.

Shell sub-globose, thin, pellucid, not umbilicated; spire small, compressed, whorls few, smooth; aperture large, entire.

Ex. G. hyalina, *H. and A. Adams*, pl. 138, fig. 3, 3, *a*.

For this genus we are also indebted to Mr. Macdonald, who met with it very commonly in the South Pacific. He observes that the foot is not unlike a broad or square-toed shoe in form, receiving or bearing the remainder of the animal and the shell. The little animal creeps on its foot with great rapidity, appearing rather to slide along than progress by a vermicular movement, and by spreading out and hollowing this organ at the surface of the water, by the same instinct which prompts the fresh-water Limnæad to form a ready boat of its foot, this shell-protected speck buoys up its tiny body, cast abroad, though not lost, in the ocean's immensity.

PULMONIFERA.

Vol. ii. p. 104. Genus OLEACINA.

The sub-genera *Férussacia*, *Stobilus*, and *Azeca* should be removed to, and form a genus of, the *Helicidæ*, under the name of *Azeca*, M. Moquin-Tandon having described the teeth as resembling those of *Bulimus*.

Vol. ii. p. 112. Sub-fam. HELICELLINÆ.

This sub-family having a caudal gland should be removed to the family *Stenopidæ*.

Vol. ii. p. 119. Sub-fam. VITRININÆ.

This sub-family having the mantle produced and thickened in front beyond the edge of the shell should be removed to the family *Helicidæ*.

Vol. ii. p. 121. Genus PARMACELLA.

This genus having a caudal gland should be transferred to *Arionidæ*, and should be restricted to *P. Olivieri*, described by Cuvier, and to the species *gracilis*, Gray, not included

in the list, in which the body and shell are sub-globose and distinctly spiral, and in which the central portion of the shell is more or less exposed. The three species, *P. punctata*, *tæniata*, and *reticulata*, indicated by Van Hasselt as inhabiting Java, may possibly have to be associated with them.

The other species of *Parmacella* in the list were at first separated by Dr. Gray to form a new genus, *Drusia*, but, in a communication with which we have been recently favoured by him, he considers it most probable that, from the similarity of the shell of *P. Valencienii* to that of *Cryptella ambigua*, the animal in each case is included in the shell and furnished with an operculum in the young state, and suggests that until the development of these animals shall be observed, it will be better to arrange them with the genus *Cryptella*, of which *Drusia* will therefore become a synonym.

To the genus *Cryptella* also for similar reasons Dr. Gray, for the present, refers his genus *Girasia*.

The species of *Cryptella* will then stand as follows:—

Alexandrina, *Ehrenb.*
ambigua, *Férus.*
Deshayesii, *Moquin-Tand.*
Gervaisii, *Moquin-Tand.*
Hookeri, *Gray.*
infumata, *Férus.*
Mauritia, *Férus.*
Rangiana, *Férus.*
rutellum, *Hutton.*
Valencienii, *Webb and Van Ben.*

With reference, however, to *Limax extrancus* and *problematicus*, Férus., which Dr. Gray had referred, with doubt, to his genus *Girasia*, they probably belong to another distinct genus allied to *Limax*, which he proposes to call *Rigasia*.

Genus HYPSELOSTOMA, Benson.

(Fam. HELICINÆ.)

Shell convolute, conoidal, umbilicus open, last whorl free, protracted, turned upwards; aperture trumpet-like and dentate; peristome horizontal, expanded.

Syn. Tanystoma, *Bens.*, olim, not *Motschoultzky* or *Latr.*

Ex. H. tubiferum, *Benson*, pl. 138, fig. 4, 4, *a*.

This singular anastomatous genus was found by Mr. Theobald, Jun., on the banks of the Irawadi River in Burmah.

Vol. ii. p. 217. Genus LIMAX.

Sub-gen. MEGAPELTA, Mörch.

Mantle covering more than half the body. *L. semitectus*, Mörch, is an example.

Genus MILAX, Gray.

Dr. Gray has founded a genus upon *Limax gagates* and allied species, under the above name, which he thus describes:—

Back keeled to the shield. Dorsal shield granulated or shagreened, truncated, with two small pores on its hinder edge.

Shell convex.

Syn. ? Aspidoporus, *Fitzinger*.

Species of Milax.

antipodarum, *Gray*.
carinatus, *D'Orb.*
cristatus, *Kalenicz.*
gagates, *Drap.*
nigricans, *Schultz.*
Sowerbyi, *Férus.*
umbrosus, *Phil.*
Valentianus, *Férus.*
virescens, *Schultz.*

Genus MALINO, Gray.

A genus under this name has been constituted by Dr. Gray to receive the *Limax lumbricoides* of Morelet, which inhabits Portugal. He defines it as follows:—

Back keeled. Dorsal shield large, front half concentrically, hinder longitudinally furrowed, very contractile, very mobile, moving rapidly from side to side as the animal walks.

Ex. M. lumbricoides, *Morelet*, pl. 138, fig. 5.

Vol. ii. p. 226. Genus HELICARION.

The species *H. flammulata* and *viridis* have been separated by Dr. Gray as a genus, under the name of *Vitrinella*, but as *Vitrinella* is already in use, we would suggest that of *Otesia* in its place.

Genus OTESIA, H. and A. Adams (Vitrinella, *Gray*, not C. B. Adams).

Mantle-lobe covering the greater part of the shell.
Shell imperforate, very thin; spire conic.

Genus ORPIELLA, Gray.

Dr. Gray has also constituted a genus under the above name to receive *Helicarion scorpio*.

Animal with the usual anal lappet of *Nanina* covering the mucous pore, and six other smaller ones between this and the shell arranged in a double series along the back of the tail. Shell somewhat like *Cyclostoma tigrinum*. (Gould.)

Ex. O. scorpio, *Gould*, pl. 138, fig. 6.

Vol. ii. p. 227. Fam. ARIONIDÆ.

To this family must be referred the genera *Mariella* and *Laconia*, Gray, which are slug-like and have the shell partly or entirely covered by the mantle, and in which the caudal gland is present.

Genus MARIÆLLA, Gray.

Mantle or body convex, produced like a fleshy collar in front, swollen behind, and separated from the upper part of the foot, in a cavity of which it lies; fringed on the side.

Shell quite hidden by the mantle, half ovate, solid, with a thin, horny, more or less expanded edge.

Syn. Clypeicella, *Valenc. Mss.* Viquesnelia, *Desh.*

Ex. M. Dusumieri, *Valenciennes.*

Genus LACONIA, Gray.

Body sub-globose. Mantle edged, produced in front, forming a broad collar.

Shell sub-globose, entirely and permanently covered by a thin expansion of the mantle; spire of few whorls, the last very large; aperture very large, lunate.

Ex. L. Férussaci, *Gray*, pl. 138, fig. 7.

Only known by Férussac's figure (Gray).

Genus BLAUNERIA, Shuttleworth.

(Sub-fam. MELAMPINÆ.)

Shell imperforate, oblong-turreted, thin; aperture narrow, elongated; inner-lip with a single plait, columella sub-truncate; outer-lip simple, straight.

Ex. B. pellucida, *Pfeiffer* (Cubensis, *Pfeiff.*), pl. 138, fig. 8.

The observations of Dr. Gundlach have shown that the animal of this genus has the characters of *Ellobium* and not of *Oleacina*, to which genus we had referred it, judging from the shell only.

Vol. ii. p. 242. Genus CARYCHIUM.

Sub-gen. ZOSPEUM, Bourguignat.

Shell pupiform, umbilicated; spire obtuse. *C. lautum*, *obesum*, *Schmidti*, and *spelæum* are examples.

The members of this group are met with in caverns and other places from whence the light is excluded. M. Bourguignat in consequence supposes that they are without the usual organs of vision.

Genus ERINNA, H. and A. Adams.

(Fam. LIMNÆIDÆ.)

Shell semi-globose, thin, horny, olivaceous, longitudinally finely striated; spire very short, obtuse, apex rather eroded, last whorl ventricose; aperture large, semi-ovate; inner-lip posteriorly ascending on the body-whorl; columella straight, excavated, and with a curved, elevated, external ridge continued in front into the outer lip which is simple and acute.

Ex. E. Newcombi, *H. and A. Adams*, pl. 138, fig. 9.

The little shell upon which this genus is founded was obtained by Dr. Newcombe from the Henat a River, Kami, Sandwich Islands.

Vol. ii. p. 249. Sub-fam. OTININÆ.

Dr. Gray has raised this sub-family to the rank of a family to receive the genera *Otina*, *Chilina*, *Camptonyx*, and possibly *Morvillia*, which differ from *Auriculidæ* in having flattened tentacles, and from *Limnæidæ* in having the eyes on the upper part of the base of the tentacles instead of at the inner edge of the base, and in having coloured shells.

The genera *Camptonyx* and *Morvillia* have recently been described, the former by Mr. Benson, and the latter by Dr. Gray, as follows.

Genus CAMPTONYX, Benson.

(Fam. OTINIDÆ.)

Shell cap-shaped, obliquely conical, with a sub-spiral free apex directed to the right side; surface with an external longitudinal ridge and corresponding internal furrow extending from the apex to the right margin; aperture large, ovate, entire, expanded at the margin.

Ex. C. Theobaldi, *Benson*, pl. 138, fig. 10. Shell, C. Theobaldi, fig. 10, *a*.

This interesting genus was found by Mr. W. Theobald, Jun., on the central peak of Mount Girnar, in Kattiwar, on the peninsula which separates the Gulfs of Cutch and Cambay, adhering to the rock like limpets.

Genus MORVILLIA, Gray.

(? Fam. OTINIDÆ.)

Tentacles thick, rather depressed, near together at the base. Eyes on the outer side near the base. Mantle thickened within the front. Foot oblong.

Shell ovate, orbicular, compressed; spire conical, whorls three or four, the upper small, the last very large; aperture ovate, very large, nearly the whole length of the shell; outer-lip sharp and spreading; inner-lip sharp-edged, margined with a flattened, crescent-shaped, opaque-white space.

Ex. M. zonata, *Gould.*

This genus is founded on *Velutina* (*Limneria*) *zonata*, and *Otina fusca* forms a second species.

Genus POMPHOLYX, Lea.

(Fam. LIMNÆIDÆ.)

Operculum none.

Shell rotund-gibbous, reflexed beneath, flattened above, not umbilicated; spire depressed; aperture very large, sub-circular, expanded; outer-lip acute; inner-lip thickened and slightly flattened.

Ex. P. effusa, *Lea*, pl. 138, fig. 11.

The only species of this genus yet described is from the river Sacramento in California.

Vol. ii. p. 286. Genus RAPHAULUS.

Sub-gen. STREPTAULUS, Benson.

Shell with the spiraculum reflexed, not opening on, but above, the peristome. *R. Blanfordi*, Benson, is an example.

Vol. ii. p. 308. Genus STOASTOMA.

Mr. Chitty has described a new genus, under the name of *Lewisia*, to include those species of *Stoastoma* in which the shells are as it were double-mouthed.

Genus LEWISIA, Chitty.

Shell sub-discoidal; aperture semi-ovate; peristome continuous, with a spiral callus at the base excessively developed, usually soldered by its extreme edge to the last whorl, and forming over the umbilicus an arch, having the opening larger than the aperture of the shell.

Ex. L. Philippiana, *C. B. Adams*, pl. 138, fig. 12, 12, *a*.

S. Agassizianum, and two new species described by Mr. Chitty, also from Jamaica, belong to this group.

Mr. Chitty has further proposed six other genera, which may be considered as sub-genera of *Stoastoma*. The genus *Stoastoma*, as restricted, will then comprise *S. Pisum*, *Pfeifferianum*, and a third species described by Mr. Chitty. The new sub-genera are as follows.

Sub-gen. WILKINSONÆA, Chitty.

Shell sub-discoidal, spirally carinated, last whorl much produced.

This division will include *S. Gouldianum*, *Hollandianum*, *Tappanianum*, *Wilkinsoniæ*, and nine new species described by Mr. Chitty.

Sub-gen. FADYENIA, Chitty.

Shell with the spire depressed, sub-angular on the upper part of the last whorl, sub-planate at the periphery, sub-angulated below, and sub-planate round the umbilicus.

Of this group *S. Fadyenianum* is an example, and Mr. Chitty has described two other species.

Sub-gen. METCALFEIA, Chitty.

Shell depressed, conic.

S. Chittyanum, and two new species, are included by Mr. Chitty in this division.

Sub-gen. PETITIA, Chitty.

Shell globose, discoid.

S. Petitianum, *Cumingianum*, *Anthonianum*, and nine new species are comprised in this sub-genus by Mr. Chitty.

Sub-gen. LINDSLEYA, Chitty.

Shell globose, conic.

To this section Mr. Chitty refers *S. Lindsleyanum*, *Redfieldianum*, *Jayanum*, *Leanum*, *Moricandianum*, and nineteen new species described by him.

Sub-gen. BLANDIA, Chitty.

Shell sub-discoidal.

This division will comprise *S. Blandianum*, and eight new species described by Mr. Chitty.

The new species above mentioned are all from Jamaica.

Vol. ii. p. 309. Fam. PROSERPINIDÆ.

The observations of Messrs. Bland, Chitty, Poey, Gundlach, and Gray have shown that the eyes of *Proserpina* are at the outer base of the tentacles, as in *Cyclophoridæ*, and that the animal is inoperculate. The position of the family seems to be after the *Ellobiidæ*, where Pfeiffer has placed it. Dr. Gray has separated *P. eolina*, and made it a genus under the name *Ceres*.

Genus CERES, Gray.

Shell helicinæform, carinate, rugose above, covered with a thin epidermis, base furnished with a shining callus; aperture lamelliferous, peristome straight, somewhat thickened.

Ex. C. eolina, *Duclos*, pl. 138, fig. 13.

Genus CHITTIA, Livesay.

(Fam. TRUNCATELLIDÆ.)

In a communication which we have received from Dr. Livesay

This interesting genus was found by Mr. W. Theobald, Jun., on the central peak of Mount Girnar, in Kattiwar, on the peninsula which separates the Gulfs of Cutch and Cambay, adhering to the rock like limpets.

Genus MORVILLIA, Gray.

(? Fam. OTINIDÆ.)

Tentacles thick, rather depressed, near together at the base. Eyes on the outer side near the base. Mantle thickened within the front. Foot oblong.

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Operculum none.

Shell rotund-gibbous, reflexed beneath, flattened above, not umbilicated; spire depressed; aperture very large, sub-circular, expanded; outer-lip acute; inner-lip thickened and slightly flattened.

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The only species of this genus yet described is from the river Sacramento in California.

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Sub-gen. STREPTAULUS, Benson.

Shell with the spiraculum reflexed, not opening on, but above, the peristome. *R. Blanfordi*, Benson, is an example.

and more or less covered by a sunken tubercle in front. Disk fringed.

Ex. F. agglutinans, *Lamarck* (Novæ-Zealandiæ, *Gray*).

Sub-gen. ARYTENE, Gray.

Disk simple, not fringed. *F. tuberculata* is an example.

Genus HUMPHREYIA, Gray.

Animal attaching itself when young by the ventral edges of the shell, and during its progress to the adult state extending the valves behind into a tube.

Ex. H. Strangei, *A. Adams*.

Vol. ii. p. 353. Genus MYA.

The sub-genus *Platyodon* of Conrad should be kept as a distinct genus. We have recently had an opportunity of examining a specimen of *P. cancellata* and of confirming his statement as to the siphonal orifices being furnished with testaceous appendages.

Genus TANYSIPHON, Benson.

(Fam. GLAUCONOMYIDÆ.)

Siphons produced and united nearly to the ends, the extremity of the siphonal sheath and that of the branchial orifice fringed.

Shell inequilateral, transversely oblong, rounded at each end and slightly gaping, covered with an epidermis; beaks obtuse, rather prominent. Hinge with three teeth in the right, and two in the left valve. Pallial sinus deep, extending to more than half the length of the shell.

Ex. T. rivalis, *Benson*, pl. 138, fig. 15. Shell, T. rivalis, fig. 15, *a*, 15, *b*.

This genus, which is allied to *Glauconomya*, is from the vicinity of Calcutta, and was found buried in the mud at extreme low-water.

S. Chittyanum, and two new species, are included by Mr. Chitty in this division.

Sub-gen. PETITIA, Chitty.

Shell globose, discoid.

S. Petitianum, *Cumingianum*, *Anthonianum*, and nine new species are comprised in this sub-genus by Mr. Chitty.

Sub-gen. LINDSLEYA, Chitty.

Shell globose, conic.

To this section Mr. Chitty refers *S. Lindsleyanum*, *Redfieldianum*, *Jayanum*, *Leanum*, *Moricandianum*, and nineteen new species described by him.

Sub-gen. BLANDIA, Chitty.

Shell sub-discoidal.

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The new species above mentioned are all from Jamaica.

Vol. ii. p. 309. Fam. PROSERPINIDÆ.

The observations of Messrs. Bland, Chitty, Poey, Gundlach, and Gray have shown that the eyes of *Proserpina* are at the outer base of the tentacles, as in *Cyclophoridæ*, and that the animal is inoperculate. The position of the family seems to be after the *Ellobiidæ*, where Pfeiffer has placed it. Dr. Gray has separated *P. colina*, and made it a genus under the name *Ceres*.

Genus CERES, Gray.

Shell helicinæform, carinate, rugose above, covered with a thin epidermis, base furnished with a shining callus; aperture lamelliferous, peristome straight, somewhat thickened.

Ex. C. colina, *Duclos*, pl. 138, fig. 13.

Genus CHITTIA, Livesay.

(Fam. TRUNCATELLIDÆ.)

In a communication which we have received from Dr. Livesay

In these shells sometimes the left and at other times the right valve is the flatter, and furnished with the dilated ventral edge.

Vol. ii. p. 548. Genus YOLDIA.

Sub-gen. PORTLANDIA, Mörch.

Shell trapeziform, truncated posteriorly; surface of valves concentrically striated or grooved. *Y. glacialis* and *thraciæformis* are examples.

Genus CHONDROSTACHYS, Macdonald.

(Fam. CLAVELLINIDÆ.)

Individuals attached by peduncles to the upper or free part of a long, upright, cylindrical stem. Body oblong, attached by the peduncles horizontally; test smooth, transparent; branchial orifice on the upper side, anal nearly terminal, both orifices four-lobed.

Ex. C. Macdonaldi, *H. and A. Adams*, pl. 138, fig. 16. Individual, C. Macdonaldi, fig. 16, *a*.

For this beautiful addition to the *Tunicata* we are indebted to Mr. Macdonald, Assistant-Surgeon of H.M.S. "Herald," who states that it was taken in a trawl from a depth of 10—12 fathoms, while cruising in Bass's Straits. The Individual animals measured each about half an inch in length.

ADDITIONS AND CORRECTIONS.

VOL.	PAGE	
I.	5,	line 8, for "*Busycum*" read "*Busycon*."
,,	,,	line 20, for "*Volutella*" read "*Zidona*."
,,	,,	line 27, for "*Gibbula cineraria*" read "*Gibbula umbilicaris*."
,,	11,	line 22, omit "and *Turbinidæ*."
,,	12,	line 23, for "*Turbinidæ*" read "*Trochidæ*."
,,	,,	line 28, for "*Turbinidæ*" read "*Turbininæ*."
,,	,,	line 29, for "*Trochidæ*" read "*Trochinæ*."
,,	,,	line 2 from bottom, for "*Sigaretus*" read "*Catinus*."
,,	13,	line 4, for "*Phasianella*" read "*Eutropia*."
,,	,,	line 6, for "*Trochidæ*" read "*Trochinæ*."
,,	,,	line 8, for "*Distortio*" read "*Distorsio*."
,,	,,	line 11, for "*Tympanotomus*" read "*Tympanotonos*."
,,	,,	line 13, for "*Calyptræa*" read "*Calyptra*;" and for "*Hipponyx*" read "*Cochlolepas*."
,,	15,	line 19, for "*Thetis*" read "*Tethys*."
,,	,,	line 20, for "*thecidicola*" read "*tethydicola*."
,,	,,	line 22, for "(Bær)" read "(Baer);" and for "*Neritinæ*" read "*Neritellæ*."
,,	,,	line 23, for "*Neritina*" read "*Neritella*;" and for "*Lingricitula*" read "*Linguatula*."
,,	,,	line 3 from bottom, for "*Pinnotheros*" read "*Pinnotheres*."
,,	,,	line 2 from bottom, for "*Phospuga*" read "*Phosphuga*."
,,	19,	*Octopus Carena* is a species of *Tremoctopus*.
,,	,,	line 11, for "*Octopi*" read "*Octopodes*."
,,	22,	line 16, for "*Octopi*" read "*Octopodes*."
,,	26,	line 12, for "*Loligidæ*" read "*Loliginidæ*."
,,	27,	line 7, for "*Octopidæ*" read "*Octopodidæ*."

VOL. PAGE

I. 52, line 3 from bottom, for "*Cresis*, Rang," read "*Creseis*, Rang."

,, 55, *Cymbulia radiata* is a species of *Gleba*.

,, 55, *Herse*, Gist., is a synonym of *Triptera*.

,, 56, *Philopseudis*, Gist., is a synonym of *Psyche*.

,, 58, *Crino*, Gist., is a synonym of *Limacina*.

,, 64, the definition of the Fam. *Cymodoceidæ* should continue thus: "side, at the junction between the head and abdomen with a foot-like appendage. Gills—?"

,, 69, line 17, for "two sections read "three sections."

,, 72, for "*Rhinocantha*, H. and A. Adams," read "*Haustellaria*, Mörch," the name *Haustellaria* of Swainson not being in use.

,, 73, for species "*roriflus*" read "*rorifluus*."

,, 75, for species "*dispacus*" read "*dipsacus*."

,, 75, *Ocinebra nux* is a species of *Coralliophila*.

,, 79, omit *Evarne linea* which is the same as *Euthria lineata*.

,, 80, omit *Neptunea tesselata* which is the same as *Aurinia dubia*.

,, ,, for species "*latericia*, Gould," read "*latericia*, Möll."

,, 81, line 12, omit "*Mancinella*, Mus. Berl."

,, 85, *Triumphis*, Gray, is a synonym of *Clavella*.

,, 86, line 18, for "*E. lignaria*, Lamarck," read "*E. cornea*, Linnæus."

,, ,, line 19, for "*E. lignaria*" read "*E. cornea*."

,, ,, *Clavella avellana* is a species of *Cronia*.

,, 91, omit species "*nux*, Reeve."

,, 92, *Onopota*, Mörch, is a synonym of *Bela*.

,, ,, line 14, for "low latitudes" read "high latitudes."

,, 95, for "*Defrancia*, Millet," read "*Clathurella*, Carpenter," the name *Defrancia* being preoccupied.

,, ,, for "Sub-fam. *Defranciinæ*" read "Sub-fam. *Clathurellinæ*."

,, 96, for species "*rana*" read "*rava*."

,, 102, *Neptunella*, Gray, is a synonym of *Cabestana*.

,, 104, for "*Argobuccinum*, Klein," read "*Priene*, H. and A. Adams."

VOL. PAGE

I. 104, *Linatella*, Gray, is a synonym of *Lagena*.

,, 106, for "*Apollon*, Montfort," read "*Argobuccinum*, Klein."

,, ,, line 19, for "Spine elevated" read "Spire elevated."

,, 126, line 7, for "Shell, *P. Persica*," read "Shell, *P. patula*."

,, ,, for "*Tribulus*, Klein," read "*Thais*, Bolten," and add *Canrena*, Link, as a synonym.

,, ,, for species "*Persica*, Lam.," read "*Persica*, Linn."

,, 127, for "*Thalessa*, H. and A. Adams," read "*Tribulus*, Klein," and add *Mancinella*, Link, as a synonym.

,, 130, *Ricinella*, Schum., is a synonym of *Pentadactylus*.

,, 141, *Claneophila*, Gray, is a synonym of *Olivancillaria*.

,, ,, *Anazola*, Gray, is a synonym of *Utriculina*.

,, 142, *Carmione*, Gray, is a synonym of *Dactylus*.

,, 144, *Galeola*, Gray, is a synonym of *Cylindrus*.

,, ,, for "*Porphyria*, Bolten," read "*Porphyria*, Mörch;" *Porphyria*, Bolten, is a synonym of *Strephona*.

,, 146, *Micana*, Gray, is a synonym of *Dactylidia*.

,, ,, for "*Callianax*, H. and A. Adams," read "*Olivina*, Mörch, not D'Orbigny," and add *Scaphula*, Gray, as a synonym.

,, 148, *Sandella*, Gray, is a synonym of *Amalda*.

,, ,, *Sparella*, Gray, is a synonym of *Ancilla*.

,, 149, *Anolacia*, Gray, is a synonym of *Ancillaria*.

,, 150, for "*Ieranea*" read "*Jeranea*."

,, 151, the genus *Busycon* belongs to the sub-family *Fusinæ*.

,, 152, *Latirus afer* is a species of *Tudicla*.

,, 153, omit species "*scolymus*, Gmelin."

,, 155, the genus *Fastigiella* belongs to the family *Cerithiidæ*.

,, 167, line 5 from bottom, for "eocine" read "Eocene."

,, 189, line 4 from bottom, for "*Marginellana*" read "*Marginella*."

,, 192, *Closia*, Gray, is a synonym of *Volutella*, Swains., not D'Orb.

,, 196, *Cadus*, Bolten, is a synonym of *Dolium*.

,, 201, *Ermea*, Gray, is a synonym of *Lamellaria*.

,, 202, *Lamellaria*, Gray, is a synonym of *Cryptocella*.

,, ,, *Oithonella*, Mörch, is a synonym of *Marsenina*.

VOL. PAGE

II. 116, line 7 from bottom, for "*Phlebecula*, Lowe," read "*Plebecula*, Lowe."

,, ,, *Lucilla*, Lowe, is a synonym of *Helicella*, not of *Discus*.

,, 117, for species "*nitidiusculus*, Lowe," read "*nitidiusculus*, Sow."

,, ,, *Discus scintilla* is a species of *Helicella*.

,, 118, *Crystallus*, Lowe, is a synonym of *Helicella*.

,, 130, *Pellicula*, Fischer, is a synonym of *Helisiga*, and is founded upon a new species of that genus, *H. depressa*, Fischer.

,, 131, for *Achatina*, Lamarck, it would, perhaps, be more correct to use the name *Urceus*, Klein.

,, ,, *Achatium*, Link, is a synonym of *Achatina*.

,, 135, *Perideris*, Shuttleworth, is a synonym of *Pseudotrochus*.

,, 136, *Achatinellastrum*, Pfeiffer, is a synonym of *Achatinella*.

,, 140, line 15, omit "and Madeira."

,, 148, *Porphyrobaphe*, Shuttleworth, is a synonym of *Borus*.

,, 154, *Sultana* and *Zebra*, Shuttleworth, are synonyms of *Orthalicus*.

,, 159, *Peristoma*, Kryn., is a synonym of *Ena*, not of *Bulimulus*.

,, 162, for "*Petræus*, Albers," read "*Bulimina*, Ehrenberg," which name has priority.

,, 164, line 2, for "rimate-ovate" read "rimate, ovate."

,, 171, in last line, for "genius" read "genus."

,, 172, line 13, *Craticula*, Lowe, is a synonym of *Leiostyla*, not of *Alæa*.

,, 179, line 8, omit "*Delima*, Hartm."

,, 180, for "*Elia*, H. and A. Adams," read "*Laciniaria*, Hartmann."

,, 185, the genus *Streptaxis* belongs to the sub-family *Vitrininæ*.

,, 188, *Helicomella*, Lowe, is a synonym of *Helix*.

,, ,, line 9, omit "*Plebecula*, Lowe."

,, ,, omit species "*nitidiuscula*, Sow."

,, ,, *H. Buffoniana*, *Humboldtiana*, and *punctulata* are species of *Discus*.

VOL. PAGE

II. 196, *Cryptaxis* and *Katostoma*, Lowe, are synonyms of *Cochlea*.

,, 207, *Contorta*, Mühlf., is a synonym of *Drepanostoma*.

,, 208, *Callina*, Lowe, is a synonym of *Iberus*.

,, 211, *Cryptomphalus*, Agassiz, is a synonym of *Arianta*.

,, 212, *Hystricella*, Lowe, is a synonym of *Octhephila*.

,, 213, *Caseolus*, Lowe, is a synonym of *Actinella*, not of *Octhephila*.

,, 215, *Lemniscia*, Lowe, is a synonym of *Theba*.

,, 239, for "*Sarnia*, H. and A. Adams," read "*Siona*, H. and A. Adams."

,, 247, line 4, for "*Turcia*" read "*Monica*."

,, 248, *Carassa*, Gist., is a synonym of *Pedipes*.

,, 251, for "*Ida*, Lea," read "*Ida*, Jay."

,, 252, for *Limnæa*, Lamarck, it would, perhaps, be more correct to use the name *Auricula*, Klein.

,, ,, for species "*Cepuelca*, D'Orb.," read "*Tehuelcha*, D'Orb."

,, ,, for species "*pulchra*, D'Orb.," read "*Puelcha*, D'Orb."

,, 263, for "*Spirorbis*, Swainson," read "*Bathyomphalus*, Agassiz," which name has priority.

,, 275, *Crocidopoma*, Shuttleworth, is a synonym of *Aperostoma*.

,, 286, for "*Anaulus*, Pfeiffer," read "*Raphaulus*, Pfeiffer," the former name being pre-occupied.

,, 300, line 5 from bottom, for "Equator" read "Ecuador."

,, 305, *Hapata*, Gray, is a synonym of *Viana*.

,, 312, for "*Acicula*, Hartmann," read "*Acme*, Hartmann;" and omit "*Acme*, Hartm.," from list of synonyms.

,, 313, omit species "*gracilis*, Lowe."

,, 333, for "*Uperotis*, Guettard," read "*Uperotus*, Guettard."

,, 351, for "*Panopæa*, Menard de la Groye," read "*Panomya*, Gray;" *Panopæa*, Menard de la Groye, is a synonym of *Glycimeris*.

,, 356, line 1, for "*Erodina*" read "*Erodona*."

,, 362, line 16, for "*Osteoderma*" read "*Osteodesma*."

,, 383, for "*Cacophona*, Gist.," read "*Cacophonia*, Gist."

,, 414, the species of *Ceronia* are from N. America, Chili, and N. W. Australia, as well as from California.

VOL. PAGE

II. 422, for "*Timoclea*, Leach," read "*Cytherea*, Bolten;" *Timoclea*, Leach, is a synonym of *Chione*.

,, 434, *Paphia*, Bolten, is a synonym of *Callista*, not of *Tapes*.

,, 436, for "*Metis*, H. and A. Adams," read "*Myrsus*, H. and A. Adams."

,, 439, California should be added to the localities given for the genus *Trapezium*.

,, 444, for "*Asmidia*, Gistel." read "*Armida*, Gistel."

,, 451, for "*Musculium*, Link," read "*Pisum*, Mühlfeldt;" *Musculium*, Link, is a synonym of *Sphærium*.

,, 455, for "*Cerastoderma*, Poli," read "*Cerastoderma*, Mörch;" *Cerastes* and *Cerastoderma*, Poli, are synonyms of *Cardium*.

,, 482, *Stephanopus*, Scacchi, is a synonym of *Solemya*.

,, 501, *Limnoica*, Leach, is a synonym of *Anodonta*.

,, 514, *Pisina*, Mörch, is a synonym of *Crenella*.

,, 533, *Thyas*, Gray, is a synonym of *Arca*.

,, 534, line 6 from bottom, for "Arcs" read "Arks."

,, 535, for "*Acar*, Gray," read "*Daphnoderma*, Mörch, not Poli," which name has priority.

,, 545, add species "*nucleus*, Linn." to list of species of *Nucula*.

,, 546, for "*Leda*, Schumacher," read "*Nuculana*, Link."

,, ,, for "Fam. *Ledidæ*," read "Fam. *Nuculanidæ*."

,, ,, for "Sub.-fam. *Ledinæ*," read "Sub-fam. *Nuculaninæ*."

,, 566, *Ephippium*, Bolten, and *Sellaria*, Link, are synonyms of *Placuna*.

,, 582, for "*Hermithyris*, D'Orb.," read "*Hemithyris*, D'Orb."

DATES OF PUBLICATION

OF THE

PLATES AND LETTER-PRESS AS ISSUED IN PARTS.

Part.	Plates.	Letter-press.	When published.
I.	1 to 4	Vol. i. pp. 1 to 32	January 1853
II.	5— 8	,, 33— 64	February ,,
III.	9— 12	,, 65— 96	June ,,
IV.	13— 16	,, 97—128	August ,,
V.	17— 20	,, 129—160	September ,,
VI.	21— 24	,, 161—192	October ,,
VII.	25— 28	,, 193—224	November ,,
VIII.	29— 32	,, 225—256	December ,,
IX.	33— 36	,, 257—288	January 1854
X.	37— 40	,, 289—320	February ,,
XI.	41— 44	,, 321—352	March ,,
XII.	45— 48	,, 353—384	April ,,
XIII.	49— 52	,, 385—416	May ,,
XIV.	53— 56	,, 417—448	June ,,
XV.	57— 60	,, 449—484	July ,,
XVI.	61— 64	Vol. ii. 1— 28	September ,,
XVII.	65— 68	,, 29— 60	October ,,
XVIII.	69— 72	,, 61— 92	November ,,
XIX.	73— 76	,, 93—124	January 1855
XX.	77— 80	,, 125—156	February ,,
XXI.	81— 84	,, 157—188	April ,,
XXII.	85— 88	,, 189—220	June ,,
XXIII.	89— 92	,, 221—252	September ,,
XXIV.	93— 96	,, 253—284	November ,,
XXV.	97—100	,, 285—316	March 1856
XXVI.	101—104	,, 317—348	June ,,
XXVII.	105—108	,, 349—380	August ,,
XXVIII.	109—112	,, 381—412	November ,,
XXIX.	113—116	,, 413—444	March 1857
XXX.	117—120	,, 445—476	April ,,
XXXI.	121—124	,, 477—508	September ,,
XXXII.	125—128	,, 509—540	December ,,
XXXIII.	129—132	,, 541—572	January 1858
XXXIV.	133—136	,, 573—604	May ,,
XXXV. } XXXVI. }	137—138	,, 605— 660	November ,,

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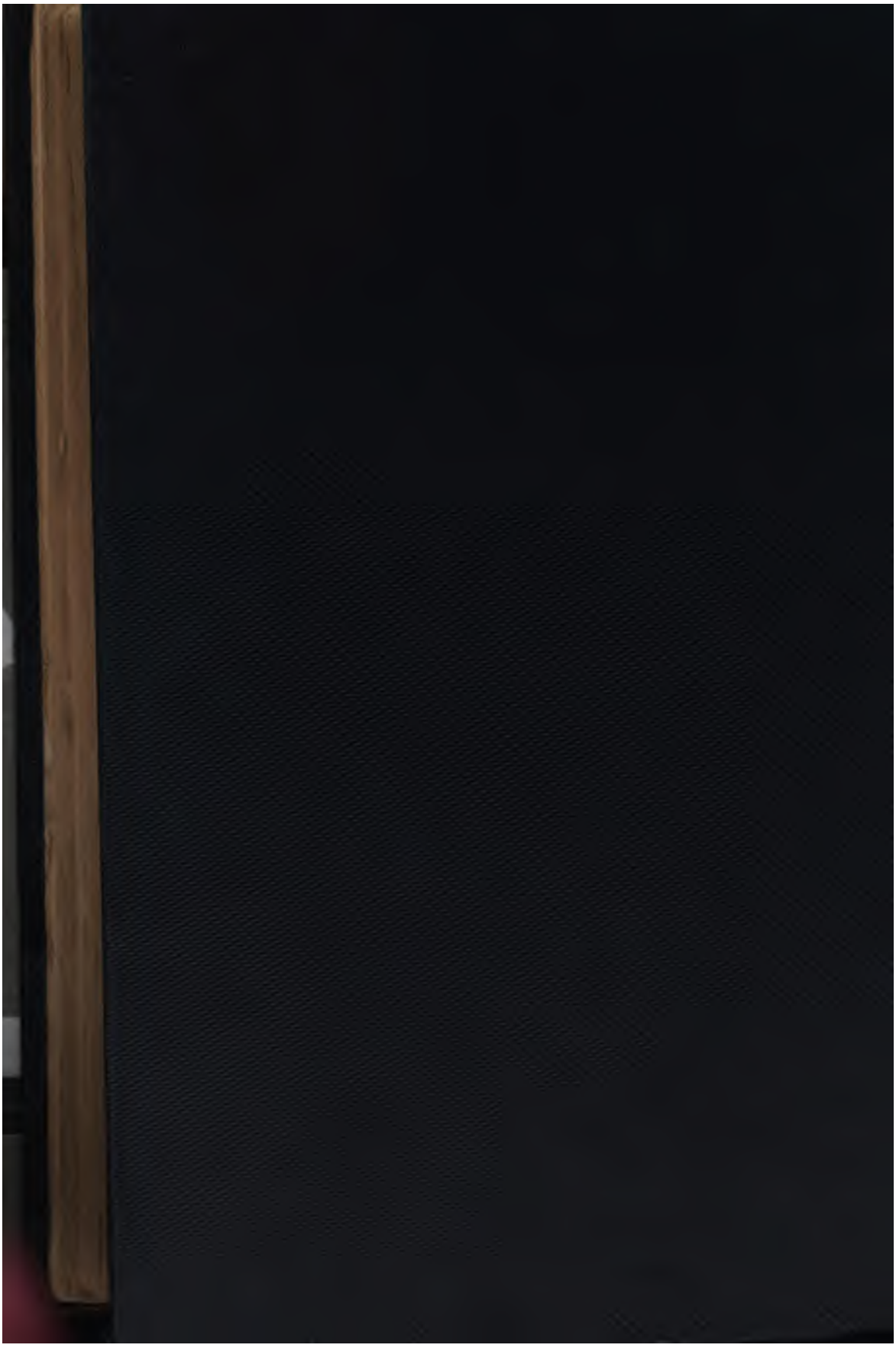
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